Vol. 999 Number 2

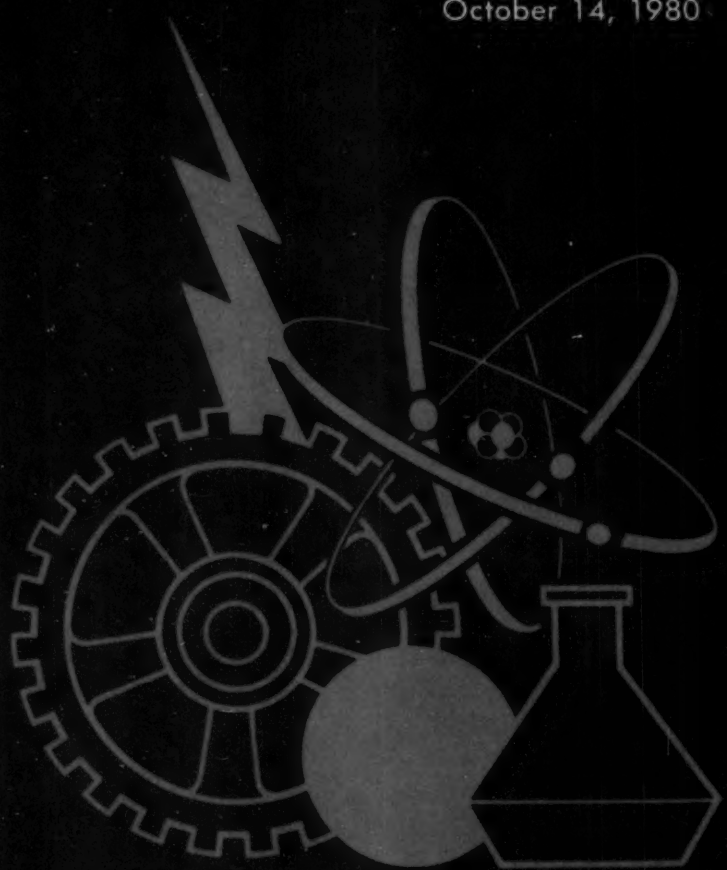
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 14, 1980



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 14, 1980 Volume 999 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 3, 1980:

Ansher, Harold, 11703 Fulham St., Silver Spring, Md. 20902
Ansher, Norton, 13102 Middlevale Lane, Silver Spring, Md. 20906
Arnold, Donald J., 2811 Sudberry Lane, Bowie, Md. 20715
Carlson, Walter L., 3519 Kirkwood Dr., Fairfax, Va. 32031
Champion, Marvin A., 1600 S. Eads St., #836–N, Arlington, Va. 22202
Drummond, Douglas J., Route 1, Box 369, Berkeley Springs, W. Va. 25411
Ferber, David, Zion Canyon Campground, P.O. Box 99, Springdale, Utah 84767
Jones, DeWalden W., Sr., 1310–42nd St., S.E., Washington, D.C. 20029
Kelmachter, Barry L., 130 Brooklawn Circle, New Haven, Conn. 06511
Latham, R. Brant, Suite 2900, 2 Bloor St. East, Toronto, Canada
Levine, Herbert, 10803 Calvalier Dr., Silver Spring, Md. 20901
Lipman, Steven E., 5223 Lewisham Rd., Fairfax, Va. 22030
Nelson, Loren D., 22288 Blue Jay Rd., Morrison, Colo. 80465

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,767,054, Re. S.N. 170,961, Filed Jul. 21, 1980, Cl. 210/232, SELF-SEALING FILTER TUBE, Roger M. Farrow, et al., Owner of Record: *Whatman Reeve Angel Limited, Kent, England,* Attorney or Agent: Frank P. Porcelli, Ex. Gp.: 176

3,907,884, Re. S.N. 170,337, Filed Jul. 21, 1980, Cl. 562/609, FORMIC ACID SYNTHESIS BY LOWER ALKYL FORMATE HYDROLYSIS, James B. Lynn, et al., Owner of Record: *Bethlehem Steel Corporation, Bethlehem, Pa.,* Attorney or Agent: Joseph J. O'Keefe, Ex. Gp.: 126

3,909,598, Re. S.N. 170,932, Filed Jul. 21, 1980, Cl. 236/364, AUTOMATIC VOLATILITY COMPUTER, Michael John Collins, et al., Owner of Record: *Cem Corporation, Indian Trail, N.C.,* Attorney or Agent: Joell T. Turner, Ex. Gp.: 236

3,968,997, Re. S.N. 170,433, Filed Jul. 21, 1980, Cl. 406/71, FEED MATERIAL HANDLING APPARATUS, Aquila D. Mast, et al., Owner of Record: *Sperry Rand Corporation, New Holland, Pa.,* Attorney or Agent: Frank A. Seemar, et al., Ex. Gp.: 313

4,005,252, Re. S.N. 164,796, Filed Jun. 30, 1980, Cl. 13/33, APPARATUS FOR GAS COLLECTION IN OPEN ELECTRIC SMELTING FURNACES, Harald Krogsrud, Owner of Record: *Elkem-Spigerverket A/S, Oslo, Norway,* Attorney or Agent: William D. Lucas, Ex. Gp.: 213

4,071,312, Re. S.N. 170,933, Filed Jul. 21, 1980, Cl. 8/7, GREEN-YELLOW TO ORANGE MONOAZO PAPER DYES, John Blackwell, Owner of Record: *Mobay Chemical Corporation, Pittsburgh, Pa.,* Attorney or Agent: Robert E. Black, Ex. Gp.: 144

4,083,686, Re. S.N. 169,391, Filed Jul. 16, 1980, Cl. 8/41 R, UNIFORMLY DYED WATER-SWELLABLE CELLULOSIC FIBERS, Peter Dimroth, et al., Owner of Record: *BASF Aktiengesellschaft, Rheinland-Pfalz, Germany,* Attorney or Agent: Herbert B. Keil, et al., Ex. Gp.: 144

4,095,343, Re. S.N. 170,279, Filed Jul. 21, 1980, Cl. 33/ILE, BUILDING LAYOUT TEMPLATES, J. C. McPhail, Owner of Record: *Inventor,* Attorney or Agent: B. Franklin Griffin, Jr., et al., Ex. Gp.: 243

4,100,502, Re. S.N. 168,777, Filed Jul. 11, 1980, Cl. 330/264, CLASS B FET AMPLIFIER CIRCUIT, Osamu Yamashiro, Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 252

4,106,819, Re. S.N. 171,603, Filed Jul. 23, 1980, Cl. 303/038, EMERGENCY PORTION FOR A BRAKE CONTROL VALVE, James E. Hart, Owner of Record: *American Standard, Inc., Wilmerding, Pa.,* Attorney or Agent: R. W. McIntire, Jr., et al., Ex. Gp.: 315

4,138,807, Re. S.N. 164,155, Filed Jun. 30, 1980, Cl. 52/309.3, GLAZING STRIP AND METHOD, Martin Trachtenburg, et al., Owner of Record: *Inventors,* Attorney or Agent: John C. Hilton, Ex. Gp.: 354

4,170,929, Re. S.N. 168,362, Filed Jul. 10, 1980, Cl. 93/53 SD., APPARATUS FOR SETTING UP FOLDED CARTONS, James E. McDowell, Owner of Record: *Inventor,* Attorney or Agent: Richard H. Stern, Ex. Gp.: 324

4,184,430, Re. S.N. 166,646, Filed Jul. 7, 1980, Cl. 102/24 R, METHOD AND APPARATUS FOR SEVERING TUBING, Wayne E. Mock, Owner of Record: *Jet Research Center, Inc., Arlington, Tex.,* Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 221

4,184,519, Re. S.N. 170,403, Filed Jul. 21, 1980, Cl. 139/425 A, FABRICS FOR PAPERMAKING MACHINES, Robert L. McDonald, et al., Owner of Record: *Wisconsin Wires, Inc., Appleton, Wis.,* Attorney or Agent: Frank J. Benasutti, et al., Ex. Gp.: 353

4,194,409, Re. S.N. 169,226, Filed Jul. 15, 1980, Cl. 74/217 B, FRONT DERAILLEUR FOR A BICYCLE PROVIDED WITH A SWINGINGLY MOVABLE CHAIN GUIDE, Masashi Nagano, Owner of Record: *Shimano Industrial Company, Limited, Osaka, Japan,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 352

4,194,709, Re. S.N. 162,365, Filed Jun. 23, 1980, Cl. 244/155 R, MECHANISM FOR RELEASABLY ATTACHING AN OBJECT TO A KITE, James M. Segerson, et al., Owner of Record: *Inventors,* Attorney or Agent: John R. Walker, III, et al., Ex. Gp.: 315

4,201,274, Re. S.N. 170,140, Filed Jul. 18, 1980, Cl. 181/156, SYMMETRICAL SPEAKER HAVING STRUCTURAL REINFORCING PORTS, Christopher Carlton, Owner of Record: *Inventor,* Attorney or Agent: Jack E. Dominik, Ex. Gp.: 211

PATENT NOTICES

Certificates of Correction for the Week of Oct. 14, 1980

3,936,966	4,166,187	4,199,545	4,208,461
3,987,859	4,166,912	4,200,198	4,208,468
3,995,631	4,172,093	4,200,380	4,208,498
4,046,075	4,172,598	4,201,224	4,208,586
4,055,636	4,174,431	4,201,464	4,208,881
4,076,961	4,175,135	4,202,215	4,208,959
4,083,306	4,176,219	4,202,282	4,209,160
4,098,992	4,176,577	4,202,328	4,209,563
4,104,500	4,180,166	4,203,099	4,210,104
4,105,789	4,182,827	4,203,950	4,210,330
4,110,289	4,186,537	4,204,514	4,210,475
4,112,685	4,188,343	4,204,851	4,210,739
4,119,567	4,188,797	4,204,979	4,210,978
4,120,543	4,188,804	4,205,065	4,211,015
4,125,156	4,189,096	4,206,247	4,212,240
4,130,591	4,189,387	4,206,979	4,212,718
4,141,859	4,189,972	4,207,070	4,212,740
4,146,482	4,190,568	4,207,556	4,213,001
4,146,499	4,194,814	4,207,730	4,213,421
4,152,773	4,195,102	4,207,835	4,213,743
4,157,433	4,195,569	4,208,009	4,213,924
4,157,582	4,196,324	4,208,076	4,214,016
4,162,583	4,198,343	4,208,197	4,214,469
4,164,041	4,198,386	4,208,272	4,215,698
		4,208,436	4,216,188

Disclaimers

3,994,990.—*Danny R. Foote*, Spirit Lake, Iowa. OPTICALLY BRIGHTENED NYLON MONOFILAMENT FISHING LINE. Patent dated Nov. 30, 1976. Disclaimer filed Aug. 20, 1980, by the assignee, *Berkley & Company, Inc.*

The term of this patent subsequent to November 30, 1993 has been disclaimed.

4,144,743.—*Morris T. Covington* and *Steven M. Griffin*, Houston, Tex. ELECTRONIC FLUID PIPELINE LEAK DETECTOR AND METHOD. Patent dated Mar. 20, 1979. Disclaimer filed Aug. 25, 1980, by the assignee, *Shafer Valve Company.*

Hereby enters this disclaimer to claim 8 of said patent.

4,195,565.—*August V. Cordeiro*, East Greenwich, R.I. FLUID-OPERATED PRESS. Patent dated Apr. 1, 1980. Disclaimer filed Aug. 18, 1980, by the assignee, *Electric Terminal Corporation.*

Hereby enters this disclaimer to claims 1 and 5 of said patent.

Dedication

4,147,705.—*Thomas M. Brennan*, Old Lyme; *Daniel P. Brannegan*, Pawcatuck; *Paul D. Weeks* and *Donald E. Kuhla*, Gales Ferry, Conn. PREPARATION OF GAMMA-PYRONES. Patent dated Apr. 3, 1979. Dedication filed Aug. 6, 1980, by the assignee, *Pfizer Inc.*

Hereby dedicates to the Public the entire term of said patent.

Erratum

All reference to Defensive Publication No. T998,011 to Kenneth Harvey of New York for DENTIFRICES appearing in the OFFICIAL GAZETTE of Sept. 2, 1980 should be deleted since the application was not published.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE
AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6–133,767. Aircraft Self-Sealing Fuel Tank and Method of Fabricating. Filed Mar. 25, 1980.

Patent application 6–133,769. All-Flexure Linear Isolation/Suspension System. Filed Mar. 25, 1980.

Patent 4,199,175. Ribbed Flange Modified Seal. Filed Apr. 28, 1978. Patented Apr. 22, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–015,675. Fluidic Controlled Diffusers for Turbopumps. Filed Feb. 27, 1979.

Patent application 6–095,866. Nitrile Rubber Adhesion. Filed Nov. 19, 1979.

Patent application 6–101,292. Teletype Loop Switching Matrix. Filed Dec. 7, 1979.

Patent application 6–117,323. Universal Firing Device. Filed Jan. 31, 1979.

Patent application 6–117,702. Two Stage Parachute Fuze Recovery System. Filed Feb. 1, 1980.

Patent application 6–117,708. An Improved Self-Powered Vehicle Detection System. Filed Feb. 1, 1980.

Patent application 6–121,948. Transmissive and Reflective Liquid Crystal Display. Filed Feb. 15, 1980.

Patent application 6–122,388. Cooling Apparatus for Electronic Modules. Filed Feb. 19, 1980.

Patent application 6–126,269. The Recrystallization of Hexanitrostilbene From Nitric Acid and Water. Filed Mar. 3, 1980.

Patent application 6–129,061. Sulfur Dioxide Detector. Filed Mar. 10, 1980.

Patent application 6–135,392. Fill Machine. Filed Mar. 31, 1980.

Patent application 6–136,858. Blocking Feed Through for Coaxial Cable. Filed Apr. 3, 1980.

Patent application 6–137,026. Coupling for Quick Attachment to Plate-Like Structure. Filed Apr. 3, 1980.

Patent application 6–137,177. Multi-Mode Microwave Lens Antenna. Filed Apr. 4, 1980.

Patent application 6–137,681. Submarine Rescue Cable Real. Filed Apr. 7, 1980.

Patent application 6–138,640. Improved Chirp Filters/Signals. Filed Apr. 9, 1980.

Patent application 6–138,950. Fiber Optic Sensors. Filed Apr. 9, 1980.

Patent application 6–139,315. Fiber Optic Light Valve. Filed Apr. 11, 1980.

Patent 4,169,257. Controlling the Directivity of a Circular Array of Acoustic Sensors. Filed Apr. 28, 1978. Patented Sept. 25, 1979. Not available NTIS.

Patent 4,170,904. Single-Axis Disturbance Compensation System. Filed Dec. 12, 1977. Patented Oct. 16, 1979. Not available NTIS.

Patent 4,183,316. Variable Volume Depth Control. Filed Dec. 5, 1977. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,184,078. Pulsed X-Ray Lithography. Filed Aug. 15, 1978. Patented Jan. 15, 1980. Not available NTIS.

Patent 4,185,552. Mine Firing Control System. Filed May 16, 1945. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,185,556. Mine Firing System. Filed June 6, 1945. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,185,881. Underwater Cable Cutting Device. Filed Dec. 6, 1951. Patented Jan. 29, 1980. Not available NTIS.

Patent 4,187,290. Carrier and Dispersal Mechanism for a Microorganic Larvicide. Filed Apr. 18, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,549. Double Precision Residue Combiners/Coders. Filed Sept. 5, 1978. Patented Feb. 5, 1980. Not available NTIS.

Patent 4,187,779. Marine Mine. Filed Apr. 19, 1945. Patented Feb. 12, 1980. Not available NTIS.

Patent 4,189,999. Vector Acoustic Mine Mechanism. Filed Mar. 5, 1956. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,190,701. V_3Ga Composite Superconductor. Filed Apr. 6, 1979. Patented Feb. 26, 1980. Not available NTIS.

Patent 4,191,028. Dry Ice. Liquid Pulse Pump Cooling System. Filed June 22, 1978. Patented Mar. 4, 1980. Not available NTIS.

Patent 4,192,573. Variable Power Attenuator for Light Beams. Filed Oct. 13, 1978. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,072. Combination Infrared Radio Fuze. Filed Mar. 13, 1962. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,088. Optical Heterodyne System for Imaging in a Dynamic Diffusive Medium. Filed Aug. 2, 1978. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,193,130. Fiber Optic Hydrophone for Use as an Underwater Electroacoustic Standard. Filed Sept. 7, 1978. Patented Mar. 11, 1980. Not available NTIS.

Patent 4,194,150. Method and Apparatus for Reducing Magnetometer Errors. Filed Sept. 26, 1958. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,194,244. Angle Sensing System. Filed Aug. 17, 1978. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,195,166. Alkanediamide-Linked Polyphthalocyanines Coordinated With $SnCl_2$. Filed Oct. 23, 1978. Patented Mar. 25, 198. Not available NTIS.

Patent 4,195,280. Tuned Electrolytic Detector. Filed May 5, 1955. Patented Mar. 25, 1980. Not available NTIS.

Patent 4,195,361. Variable Frequency Acoustic Filter. Filed Apr. 27, 1956. Patented Mar. 25, 1980. Not available NTIS.

Patent 4,195,798. Universal Tow Target Adapter. Filed Sept. 15, 1978. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,196,401. Method and Apparatus for Injecting Gas Into a Laser Cavity. Filed Apr. 17, 1978. Patented Apr. 1, 1980 Not available NTIS.

Patent 4,196,876. Banner Towing Adapter. Filed July 18, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,197,507. Suppressing Pulse Synthesizer. Filed Apr. 7, 1978. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,197,544. Windowed Dual Ground Plane Microstrip Antennas. Filed Sept. 28, 1977. Patented Apr. 8, 1980. Not available NTIS.

Patent 4,198,703. Submarine Simulating Sonar Beacon. Filed May 12, 1960. Patented Apr. 15, 1980. Not available NTIS.

Patent 4,199,006. Pneumatic Valve. Filed Feb. 28, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,201,952. Gas Laser Aerodynamic Window. Filed Apr. 11, 1978. Patented May 6, 1980. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code G–2, Washington, D.C. 20546

Patent application 6–100,611. Mechanical End Joint System for Structural Column Elements. Filed Dec. 5, 1979.

Patent application 6–135,039. An Image Readout Device With Electrically Variable Spatial Resolution. Filed Mar. 28, 1980.

Patent application 6–135,040. Wind Tunnel Supplementary Mach Number Minimum Section Insert. Filed Mar. 28, 1980.

Patent application 6–135,057. Decoupler Pylon: Wing/Store Flutter Suppressor. Filed Mar. 28, 1980.

Patent application 6–136,660. Method for Making Patterns for Resin Matrix Composites. Filed Apr. 2, 1980.

Patent application 6–138,944. Open Ended Ratchet Type Tubing Cutter. Filed Apr. 9, 1980.

Patent 4,192,290. Combined Solar Collector and Energy Storage System. Filed Apr. 28, 1978. Patented Mar. 11, 1980. Not available NTIS.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch Westwood Bldg., Bethesda, Md. 20205

Patent application 6–141,676. Microtome With Refrigerant Container for Cooling Paraffin Blocks During Sectioning. Filed Apr. 18, 1980.

Patent application 6–129,982. Steel Wire Pressure Aesthesiometer. Filed Mar. 11, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
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California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 23, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-7-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	2-4-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-29-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-9-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-4-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-3-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-29-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-3-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	4-2-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during August 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,099,837 to 3,102,269, inclusive
Plant Patents ..... Numbers 2,271 to 2,276, inclusive

REISSUES

OCTOBER 14, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,417

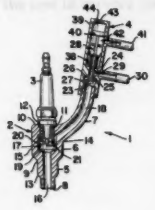
FUEL SAVING APPARATUS FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINES

Earl W. Rand, Jr., 2101 Washington, Kansas City, Mo. 64108

Original No. 4,018,204, dated Apr. 19, 1977, Ser. No. 646,361, Jan. 2, 1976. Application for reissue Oct. 2, 1978, Ser. No. 947,713

Int. Cl.[3] **F02D** *9/00*

U.S. Cl. 123—198 F **10 Claims**



1. A fuel saving apparatus for multiple cylinder spark ignition internal combustion engines having a carburetor filtered air portion, said apparatus comprising:

a. an elongated tubular body member including an externally threaded first body portion adapted for sealing engagement within an engine cylinder spark plug aperture;

b. an apertured second body portion being internally threaded and adapted for sealingly receiving and engaging therein a spark plug;

c. a third body portion disposed adjacent said second body portion and including an aperture therethrough;

d. said body member including a central longitudinal aperture interconnecting the first, second and third body portions; and

e. a valve member in said third body portion and adapted to move between an open and a closed condition respectively for opening and closing said third body portion aperture, said valve member having first and second ends; said valve member first end being sealingly attached to said third body portion about the aperture therein; said valve member second end being adapted for connection with said filtered air portion; said valve member, in said open condition causing cylinder intake vacuum to be reduced to the extent that an engine cylinder having connection therewith is rendered temporarily ineffective and engine fuel consumption is thereby reduced.

PLANT PATENTS

GRANTED OCTOBER 14, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,601

SWEET GUM

John D. Siebenthaler, Dayton, Ohio, assignor to The Siebenthaler Company, Dayton, Ohio

Filed Aug. 21, 1978, Ser. No. 936,410

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinctive variety of *Liquidamber styraciflua* substantially as herein shown and described characterized particularly in the extent to which the multitude of fall colors are developed randomly throughout the tree and substained and in the hardiness of the tree to survive colder temperatures.

PLANT PATENTS

GRANTED OCTOBER 14, 1980

PATENTS

GRANTED OCT. 14, 1980

ERRATA

For CLASS	See PATENT NO.
474–156	4,227,422
474–177	4,227,423
474–256	4,227,424
474–213	4,227,425
440–063	4,227,480
440–061	4,227,481
410–012	4,227,734
416–186 R	4,227,868
430–323	4,227,983
264–321	4,228,076
556–422	4,228,092
556–482	4,228,093
568–379	4,228,104
568–325	4,228,105
570–197	4,228,106
570–134	4,228,107
428–288	4,228,194
525–058	4,228,218
568–563	4,228,306
455–012	4,228,401
179–001 VL	4,228,402
356–004	4,228,521

PATENTS

GRANTED OCT. 14, 1980

ERRATA

PATENTS

GRANTED OCTOBER 14, 1980

GENERAL AND MECHANICAL

4,227,262

PROTECTIVE SUIT WITH INSULATED HEAD PIECE

Stig G. E. Insulan, Brasted, Sweden, and Jorn Stubdal, Fagerstrand, Norway, assignors to Viking-Askim A/S, Norway

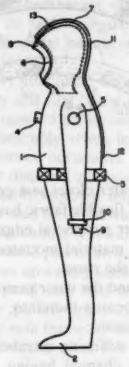
Continuation-in-part of Ser. No. 831,557, Sep. 8, 1977, Pat. No. 4,136,402. This application Nov. 14, 1978, Ser. No. 960,599

Claims priority, application Norway, Sep. 9, 1976, 763090

The portion of the term of this patent subsequent to Jan. 30, 1996, has been disclaimed.

Int. Cl.[2] B63C *11/04*

U.S. Cl. 2—2.1 R **21 Claims**



1. A dry protective water and air/gas-impervious suit adapted to cover the entire body of a wearer except the hands and face,

arranged and constructed to be donned and taken off by the wearer,

comprising

a hood having an opening for the wearer's face;

said hood including in overlapping relationship a water and air/gas-impervious outer layer and

an inner layer,

said layers being sealed to one another at said face opening to define with one another an inflatable clearance surrounding the head of the wearer;

a body part covering the body of the wearer below the neck; having an upper portion to sealingly surround the neck of the wearer and being sealingly connected to said hood;

said body part being inflatable to provide heat insulation between said body part and the body of the wearer;

means for communicating said inflatable clearance of the hood with the interior of said body part to provide insulation in form of a thermally insulating layer which surrounds the entire body of the wearer except for the hands and face;

a sealable opening in said suit to enable the wearer to don and take off said suit; and

wearer-operated sealing means for sealingly closing said opening in said body part.

4,227,263

REVERSIBLE BASEBALL GLOVE

Israel Zidele, 1303 Ditmas Ave., Brooklyn, N.Y. 11226

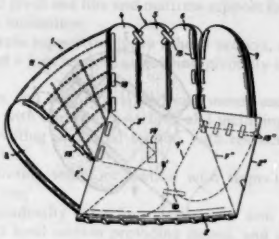
Filed Jun. 8, 1979, Ser. No. 46,798

Int. Cl.[2] A41D *13/10*

U.S. Cl. 2—19 **13 Claims**

1. In a baseball glove comprising juxtaposed front and rear pieces of tough flexible sheet material provided with a middle finger stall, two intermediate finger stalls and two outer finger stalls, lacing means for peripherally interconnecting said pieces, and a web between one of said outer finger stalls and the adjoining intermediate finger stall,

the improvement wherein said outer finger stalls are of symmetrically identical shape and wide enough to accommodate the thumb of a user, said web being selectively



retainable by said lacing means between either of said outer finger stalls and the respectively adjoining intermediate finger stall for enabling use with either hand, said outer finger stalls being attached to said front and rear pieces only by said lacing means.

4,227,264

CONVERTIBLE WOMEN'S ENSEMBLE

Donald Spector, and Anita Burch, both of 380 Mountain Rd., Union City, N.J. 07087

Filed Jul. 26, 1979, Ser. No. 61,012

Int. Cl.[2] A41D *9/00*

U.S. Cl. 2—84 **6 Claims**

1. A convertible women's ensemble capable of satisfying a range of apparel requirements, said ensemble comprising:

A. a pair of slacks;

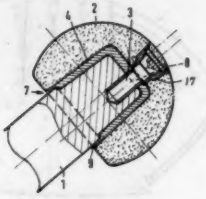
B. a jacket matching the slacks to define a pants suit, said jacket having arm holes and a removable hood which is convertible into a carrying bag for the slacks; and

C. a removable liner whose long edges are attachable to the inside of said jacket in a liner mode and to each other in a skirt mode to define a skirt to replace the slacks said liner having zippered slits at positions corresponding to the arm holes of the jacket which slits are open in the liner mode and closed in the skirt mode.

4,227,265
BONE IMPLANT WITH PLASTIC INSERT BETWEEN ELEMENTS OF DIFFERENT MECHANICAL PROPERTIES

Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 23, 1978, Ser. No. 908,688
Claims priority, application Switzerland, May 23, 1977, 6310/77
Int. Cl.[3] A61F 1/03
U.S. Cl. 3—1.913 11 Claims

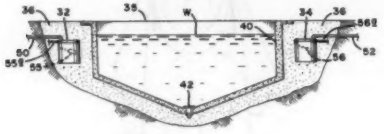


1. A bone implant construction comprising
a pair of elements of different mechanical properties disposed in relative movable relation, said elements being disposed to transfer loading forces therebetween and to define a shaped predetermined gap therebetween with an abrupt transition to a narrowing section at at least one end of said gap, said section extending at least substantially in the direction of said loading forces; and
a resiliently distortable removable plastic member confined in said gap to maintain said elements out of contact with each other, said plastic member having a cylindrical portion to surround one element and a narrowed thin-walled extension coaxial with said cylindrical portion and engaged in said narrowing section to inhibit cold plastic creep of said cylindrical portion from said gap at said one end.

4,227,266
GROUND WATER LEVEL CONTROL SYSTEM

Clayton C. Russell, York, Pa., assignor to Fox Pool Corporation, York, Pa.

Filed Nov. 20, 1978, Ser. No. 962,343
Int. Cl.[3] E04H 3/16; F16L 5/00
U.S. Cl. 4—496 10 Claims

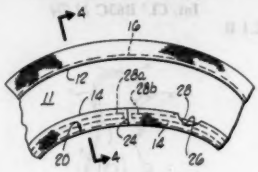


1. A system for controllng ground water in an area which would be disrupted by rising ground water, comprising a water permeable container positioned in said area, a porous substrate contiguous to said container through which ground water freely passes into the container from the area to be controlled, a cover for said container wherein means for detecting the level of ground water in the container and means for evacuating water from the container are mounted, separator means on the lower surface of said cover, said water level detecting means extending through a side of said cover in a horizontal fashion and downwardly through said separator means, said evacuating means being attached to said separator means said means for detecting the level of ground water including water level indicator comprising a float depending into said container to indicate the rise above a predetermined level of ground water in said area, and means remote from said container and responsive to said indicator to effectively evacuate from said container water which is above the predetermined level in said container.

4,227,267
COVER FOR WATER CLOSET SEAT

Carl L. Robertson, Oklahoma City, Okla.

Continuation-in-part of Ser. No. 945,200, Sep. 25, 1978, abandoned. This application Jan. 25, 1979, Ser. No. 6,427
Int. Cl.[3] A47K 13/14
U.S. Cl. 4—234 10 Claims

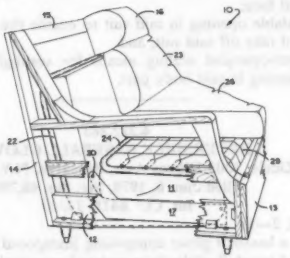


1. A cover for a water closet seat comprising:
an annular panel of flexible fabric having an inner peripheral edge and an outer peripheral edge;
a band of resilient material mounted around the outer peripheral edge of the panel;
a hem channel around the inner peripheral edge of the panel and having an opening thereinto;
a channel closure means;
a resilient, flexible stiffening member of tubular configuration in the hem channel having a first end positioned immediately adjacent said channel closure means, and a second end positioned immediately adjacent said channel closure means on the opposite side thereof from said first end, said stiffening member having a portion between said first and second ends which bridges across said channel opening; and
said channel closure means extending transversely across and blocking the hem channel at one point around its peripheral extent which is spaced from said opening into the channel for preventing said stiffening member from shifting in said hem channel thereby to prevent the inadvertent exiting of either end of said stiffening member through the channel opening.

4,227,268
CONVERTIBLE FURNITURE

William V. Gerth, 451 Phillip St., Waterloo, Ontario, Canada

Filed Oct. 30, 1978, Ser. No. 956,103
Int. Cl.[2] A47C 17/10
U.S. Cl. 5—13 1 Claim



1. Improvements in convertible furniture comprising in

combination; a frame structure having a pair of end members attached between a front panel and a back frame; a bed assembly comprising;

a rear section pivotably attached intermediate its length by a pair of pivotable swing links, to a rearward part of an upwardly extending part of a base plate fixed to said end member; said rear section being storable upwardly within a back part of said sofa frame and outwardly and downwardly moveable therefrom to provide when horizontally disposed the inward part of the convertible bed;

a mid section and a forward section foldable over one another with a mattress member therebetween and storable within said frame below said front panel and being upwardly and outwardly moveable together to provide, when horizontaly outfolded a mid part and the outward part of the convertible bed herein, said mid section being pivotably attached to said rear section and pivotably attachable to channel spacer members pivotably attached to said forward section;

support levers pivotably attachable between a forward part of said end members and first brace means, said support levers providing an upward thrust and a forward locking means to said bed assembly when in outfolded position and loaded with human occupants, by having in said position a forwardly disposed position;

said first brace is pivotably attached intermediate its length to said support lever and has a forward end linked intermediate the mid section and a rearward end linked to said rear section by one of said pair of swing levers, to maintain said rear section in an upwardly inclined position within the furniture frame until said mid section and attached forward section are pulled upwardly from out of the cavity formed in the sofa frame by the end members and the front panel, to thereby clear the upper edge of said front panel;

a pair of leg members pivotably attached forwardly of said forward section to maintain the bed assembly in horizontal plane when outfolded and loaded with occupants;

a box-like configuration of link means for locking said legs in an outfolded position when the assembly is outfolded, said box-like configuration serving to maintain the forward section in substantially level position when the assembly is in the stored position, to provide the seat support for the furniture when in use as a sofa;

and a rear section lock assembly for operational use when the bed assembly is in stored posture with said rear section extending upwardly but not substantially backwardly to maintain said mattress thereon and forwardly facing to provide a sofa occupants back support, and wherein the pivot point of the mid section and rear section is below the point of attachment of said pair of swing levers and said base plate, comprising a second brace means pivotably attachable between a point intermediate the length of said support lever and intermediate the one pair of swing levers attached to said base plate to maintain the other of said swing levers in alignment with said rear section, said second brace means providing with said first brace means with its attachment to the other of said swing levers and with the combination of the support lever, a bridge box for locking the rear section upwards to maintain the weight of a seated occupant.

4,227,269

ADJUSTABLE BED

Bruce L. Johnston, Prairie Village, Kans., assignor to Burke, Inc., Kansas City, Kans.

Filed Sep. 1, 1978, Ser. No. 938,950
Int. Cl.[2] A61G 7/14
U.S. Cl. 5—66 **7 Claims**

1. An adjustable bed comprising:

(a) a ground engaging, stationary frame;

(b) a mattress support having a center portion;

(c) an arm having one end thereof pivotally connected with said frame at a first pivot and the other end thereof pivotally connected with said center portion at a second pivot;

(d) means selectively rotating said arm about said first pivot for raising and lowering said mattress support and adjusting patient height;

(e) a longitudinally extending motor having one end thereof pivotally connected with said frame and the other end thereof pivotally connected with said center portion at a point spaced apart from said second pivot, whereby motor extension and retraction pivots said center section about said second pivot and tilts said mattress support for adjusting patient inclination;

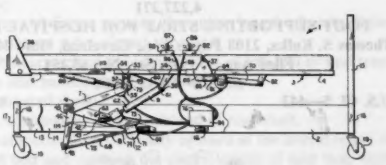
(f) said mattress support includes a head section, a center section, and a foot section, each being pivotally interconnected;

(g) said other end of said arm and said motor each being connected with said center section; and including

(h) means pivoting said head section with respect to said center section;

(i) means pivoting said foot section with respect to said center section;

(j) said longitudinally extending motor, said arm rotating means, said head section providing means, and said foot section pivoting means each includes an electric ball-and-screw motor;



(k) control means connected with said longitudinally extending motor, said arm rotation means, and said foot section pivoting means for preventing said mattress support foot section from being pivoted thereby into engagement with the ground;

(l) said longitudinally extending motor includes a first power conductor activating the same for upward tilting of said mattress support;

(m) said arm rotation means includes a second power conductor activating the same for downward elevation of said mattress support;

(n) said foot section pivoting means includes a third power conductor activating the same for downward pivoting of said foot section with respect to said center section;

(o) said control means comprises:

(1) first and second level sensing switches electrically connected in said first and second power conductors respectively, and each being mounted on said bed for rotation with raising and lowering of the bed;

(2) a third level sensing switch electrically connected in said third power conductor and mounted on said foot section for movement therewith; and

(3) said first, second and third level sensing switches being oriented on said bed for deactivating an associated one of said ball-and-screw motors for preventing inadvertent engagement of the foot section with the ground or the stationary frame.

4,227,270

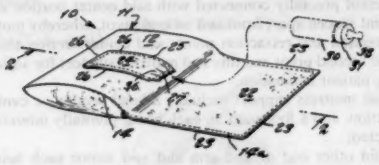
COMBINED BABY PILLOW CASE AND BOTTLE HOLDER

Rafael R. Rivera, 32-47 68th St., Flushing, N.Y. 11377

Filed Apr. 26, 1979, Ser. No. 33,750
Int. Cl.[2] A45C 9/00
U.S. Cl. 5—436 **3 Claims**

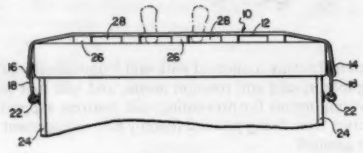
1. A combined baby pillow case and bottle holder assembly, comprising in combination a pillow case member, comprised of

a rectangular upper and lower fabric panels secured together along three side edges thereof, a pocket between said panels accessible from an opening along a fourth side edge of said pillow case, said fourth side edge forming said opening having a flap extending from an upper one of said panels, a pillow inserted through said opening into said pocket, and said upper



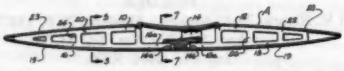
panel having said flap extending therefrom also having a small retangular, fabric panel stitched upon an upper side thereof, said small rectangular fabric panel being stitched along three side edges thereof to said upper panel to form a pocket therebetween, a fourth side edge of said small panel being unstitched to said upper panel, and forming an opening for said pocket for insertion of a baby bottle therein.

4,227,271
FOOT SUPPORTING STRAP FOR HOSPITAL BED
Thomas S. Kulka, 2108 Payne Ave., Cleveland, Ohio 44114
Filed Aug. 9, 1979, Ser. No. 65,151
Int. Cl.[2] A47C *21/00*
U.S. Cl. 5—443 **8 Claims**



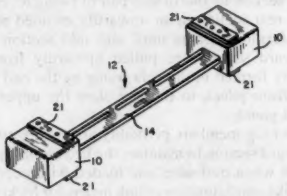
1. A foot supporting strap for beds comprising:
(a) a strap having a length longer than the width of the bed whereby the ends of the strap extend downwardly over the sides of the bed;
(b) fastening means secured respectively to the ends of said strap and the frame of said bed for detachably mounting said strap to said frame;
(c) means on the underside of said strap for spacing said strap from the mattress of the bed at two or more longitudinally spaced locations whereby in the regions adjacent said spacing means there is formed a space into which the feet of the patient can at least partially extend, said strap providing a brace against which the feet of the patient can push to permit movement of the patient to a more comfortable position.

4,227,272
SUPPORTIVE FRAMEWORK FOR A BOAT
William E. Masters, P.O. Box 64, Liberty, S.C. 29657
Filed Jan. 22, 1979, Ser. No. 5,494
Int. Cl.[3] B63B *3/00, 5/00*
U.S. Cl. 9—6 R **6 Claims**



1. In a boat of the type having a hull constructed from a generally flexible plastic skin material and a supportive framework for supporting and maintaining the configuration of said hull, wherein said framework comprises:
longitudinally extending frame means carried centrally within said hull;
said longitudinally extending frame means including an elongated bulbous bottom frame element which includes an outwardly bulging bottom wall presenting a convexly curved exterior surface to the skin material of a bottom portion of said hull; and
said bottom frame element being constructed of a sufficiently flexible material enabling said convexly curved bottom wall to flex inwardly compressing said bottom frame element upon impact of said bottom portion of said hull skin with the water or obstacles therein to distribute and relieve stress concentration on said hull effectively preventing over-flexing of said skin material and hull disfiguration (stress produced thereby).

4,227,273
AQUATIC SWIMMING AID
Benjamin A. Lucciola, R.R. 1, Box 3056 Sunrise Lake, Milford, Pa. 18337
Filed Apr. 26, 1978, Ser. No. 900,266
Int. Cl.[3] A63B *31/02*
U.S. Cl. 9—307 **2 Claims**



1. An aquatic swimming aid comprising spaced-apart floats, a rigid, elongate support structure and means connecting the ends of the support structure to the floats, said rigid, elongate support structure comprising a relatively long, flat wooden board wider than thick, said board having along one edge longitudinally-spaced slots, three in number, arranged symmetrically, two long slots and intermediate the long slots a short slot and at the other edge a slot shorter than the intermediate slot at the one edge, said slots being parallel to their respective edges, said means attaching the ends of the support structure to the floats comprising in combination openings in the confronting faces of the floats for snugly receiving the ends of the board partway but not all the way through, spaced through holes perpendicular to the openings, at least two of such holes passing through the openings, said board having in the end portions occupying the openings pairs of holes corresponding in spacing to said through holes, reinforcing members at the top and bottom sides of the floats overlying the holes, said reinforcing members containing holes corresponding in spacing to the through holes in the floats and bolts headed at one end and provided with nuts at their other ends extending through the reinforcing members, ends of the board and floats, securing the ends of the board to the floats.

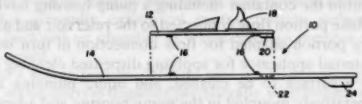
4,227,274
PIGGY BACK SKI
Richard N. Richardson, 1209 Kiowa Dr. West, Lake Kiowa, Tex. 76240
Filed Jan. 22, 1979, Ser. No. 5,398
Int. Cl.[3] A63C *35/29 R*
U.S. Cl. 9—310 R **7 Claims**

1. In a water ski of the shoe type having a relatively short

length with a foot binding mounted thereon, the improvement comprising:

a relatively longer ski blank located beneath the ski and extending parallel to said ski;

a downwardly projecting first skag secured to the rear of the ski blank for directional stability; and



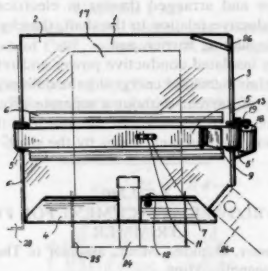
means for snap-releasably interconnecting the ski and the ski blank such that said ski blank can be released by a skier while underway, thereby allowing the skier to proceed on said ski alone.

4,227,275

METHOD AND APPARATUS FOR ALIGNING AND STAPLING SHEETS OF PAPER

Terje Söderberg, Farsta, Sweden, assignor to Guternic AB, Stockholm, Sweden

Filed Oct. 26, 1978, Ser. No. 954,985
Claims priority, application Sweden, Nov. 11, 1977, 7712798
Int. Cl.³ B27F 7/17
U.S. Cl. 11—1 R **4 Claims**



1. A device for automatically arranging individual paper sheets in a set of papers with the edges of said paper sheets in alignment with each other in combination with stapling said set of papers, said device comprising:

(a) a paper-receiving table, said table having a lower engagement edge and a lateral engagement edge;

(b) means for vibrating said table;

(c) a belt member;

(d) a motor, said motor being adapted to drive said belt member for conveying it over said table parallel to said lower engagement edge and at right angles to a lateral engagement edge;

(e) a pusher member affixed to said belt member, said pusher member comprising a portion of a first dog member adapted to urge the set of papers against the lateral engagement edge of said table when said belt member is driven by said motor;

(f) a stapler, located to receive and staple said set of papers after their edges have been aligned in the final phase of operation of said pusher member;

(g) switch means disposed in said lateral engagement edge for sensing the engagement of said set of papers with said engagement edge and causing said motor to reverse direction; and

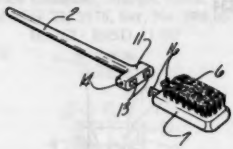
(h) an engagement member, said engagement member comprising a portion of a second dog member adapted to convey the stapled set of papers away from the table for discharging the same when said motor is reversed.

4,227,276

TOOTHBRUSH WITH THERMALLY DEFORMABLE HANDLE

Stephen J. Ginsburg, 1478 Mark Twain Ct., Ann Arbor, Mich. 48103, and Frederick E. Draheim, 4781 Surfwood Dr., Milford, Mich. 48042

Filed Feb. 7, 1979, Ser. No. 10,111
Int. Cl.³ A46B 17/00
U.S. Cl. 15—176 **7 Claims**



7. The toothbrush of claim 6 wherein said brush portion consists of:

a flat, rectangular bristle-bearing tray having a cleft in its underside running substantially the entire length of said tray;

a horizontal flange running the entire length of each of the two lateral sides of said tray; and

a knob near each of the two corners of one end of said tray;

wherein said handle portion consists of:

an elongated shaft;

a flat, rectangular bed at one end of said shaft;

sidewalls extending vertically upward at the lateral edges of said bed and running the entire length of said bed, each sidewall having a horizontal groove along the inside, said grooves running marginally less than the length of said sidewalls, not extending through at either end, and being equal in length to said flanges on said brush portion, such that as pressure is applied to the opposed, flange-bearing sides of said brush portion, said cleft is compressed, narrowing said brush portion, and said brush portion is slid into said handle portion such that said flanges are engaged by and held securely in said grooves, removal of said brush portion from said handle portion being achieved by pressing said knobs inward toward one another, thereby narrowing said brush portion and sliding said flanges free at said grooves.

4,227,277

MOP HEAD

H. William McNelley, Jr., Blairsville, Ga., assignor to American Associated Companies, Atlanta, Ga.

Filed Feb. 21, 1979, Ser. No. 13,040
Int. Cl.³ B05C 17/10
U.S. Cl. 15—229 R **3 Claims**

1. A mop head comprising:

a fixture; and

a plurality of hanging, glass yarns maintained in a bundle by said fixture, each yarn including a plurality of entangled, randomly disposed glass fibers.

4,227,278

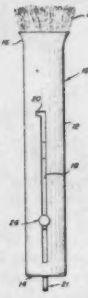
FEATHER DUSTER

Sidney Raskin, Sioux City, Iowa, and Nate Mantel, Jr., Omaha, Nebr., assignors to H. K. Specialty Co., Inc., Omaha, Nebr.

Filed Dec. 20, 1978, Ser. No. 971,246

Int. Cl.³ A47L *13/38*

U.S. Cl. 15—234 **1 Claim**



1. A feather duster comprising a tubular handle having a closed end and a flared open end, a cylindrical plug slidably mounted in said tubular handle, a plurality of feathers having their shafts secured in said plug in the formation of a plurality of rings, said shafts of the feathers being equally spaced from each other around the rings, said rings being spaced radially equal distances apart, an elongated slot in said handle, said elongated slot having a laterally extending portion adjacent the open end of said handle, a laterally extending bore in said plug, an actuating button comprising a thumb piece mounted on a pin having a barbed member on its end, said actuating button being frictionally held within said bore and projecting outwardly through said elongated slot in said handle for extending and retracting said feathers, said actuating button adapted to be positioned in said laterally extending portion of said elongated slot to lock said feathers in extended position, a ring having a barbed portion extending through a hole in the closed end of said handle for hanging the feather duster when not in use.

4,227,279

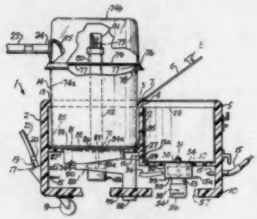
DOUBLE INSULATED APPARATUS

Herbert Tribolet, 1250 N. Third St., Grand Junction, Colo. 81501

Filed Mar. 29, 1979, Ser. No. 25,244

Int. Cl.³ A47L *11/30*

U.S. Cl. 15—321 **31 Claims**



6. Double insulated, electrically energized liquid handling apparatus, usable without a separate ground line connection, and having an exteriorly and interiorly electrically isolated electrical system comprising

an exteriorly electrically insulating container of non-conductive material, thereby providing a first insulating barrier,

a cleaning liquid dispensing reservoir protectively contained completely within the container,

a liquid delivery pump protectively contained completely within the container including a pump housing having an intake portion flow connected to the reservoir and a delivery portion adapted for flow connection in turn with an external applicator for applying dispensed cleaning liquid to a surface to be cleaned, and liquid pumping means operatively mounted in the pump housing and adapted to be driven by a rotatable shaft for pumping cleaning liquid from the intake portion to the delivery portion of the pump housing,

an electrically isolated delivery induction motor protectively contained completely within the container including a rotatably mounted shaft operatively connected for driving the pumping means, electrically insulating rotor mounting means of non-conductive material, an induction armature rotor operatively mounted by the rotor mounting means on the shaft for rotation with the shaft and arranged thereon in electrically isolating non-conductive relation with respect thereto, electrically insulating stator mounting means of non-conductive material, and an electrically energizable field coil stator radially spaced from the shaft and rotor and stationarily mounted by the stator mounting means in the container for induction rotation of the rotor and arranged thereat in electrically isolating non-conductive relation to the shaft, thereby providing a second insulating barrier, and

electrically insulated conductive power and return line circuit conduit means for energizing the delivery motor with a source of current without a separate ground line, for double insulated operation of the motor in the container for driving the pumping means by the shaft.

4,227,280

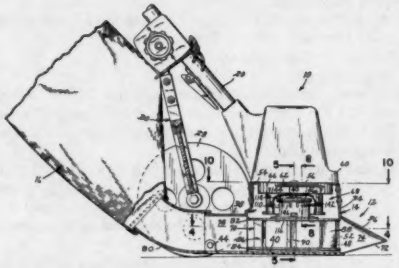
VACUUM/BLOWER ATTACHMENT FOR FILAMENT TRIMMER

Robert C. Comer, Hopkins, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Dec. 18, 1978, Ser. No. 970,628

Int. Cl.³ A47L *5/14*

U.S. Cl. 15—330 **3 Claims**



1. An attachment for use with a filament line trimmer which has a shaft and means for rotatably driving the shaft, the shaft further having means thereon for normally securing a filament line spool thereto, comprising:

(a) a fan member having a central axis and at least one blade member disposed about said axis, said fan member further having means thereon cooperating with the securing means on the shaft for removably mounting said fan mem-

ber to the shaft with said central axis aligned with the rotational axis of the shaft; and

(b) a housing removably attached to said trimmer and defining an enclosed air chamber in which said fan member is disposed, said housing having an air inlet and an air outlet opening whereby, upon rotation of said fan, air is drawn into said housing through said inlet and discharged from said housing through said outlet, said housing including:

(i) a generally cylindrical central portion defining an enclosed air chamber in which said fan member is disposed;

(ii) a scoop portion defining said air inlet opening, said scoop portion disposed peripherally with respect to said central portion and opening into said enclosed air chamber; and

(iii) a discharge chute portion extending from said central portion and opening into said enclosed air chamber, said discharge chute portion further defining said air discharge outlet;

and wherein said housing may be attached to said trimmer in a first position corresponding to a vacuum mode of operation with said inlet scoop extending forwardly and said discharge chute extending rearwardly with respect to said trimmer, and wherein said housing may be attached in a second position corresponding to a blower mode of operation with said discharge chute extending forwardly and said air scoop portion extending rearwardly with respect to the trimmer.

4,227,281

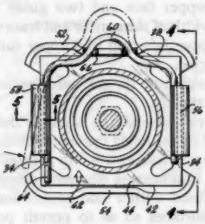
CASTER PAD

Tai H. Chung, Rancho Palos Verdes, and Damong Lee, Los Angeles, both of Calif., assignors to P. J. Company, Carson, Calif.

Continuation-in-part of Ser. No. 916,742, Jun. 19, 1978, abandoned. This application Jan. 29, 1979, Ser. No. 7,415

Int. Cl.[3] B60B *33/00*

U.S. Cl. 16—29 **5 Claims**



1. A caster pad permanently attachable to the underside of a receptacle permitting a caster to be quickly mounted thereto by insertion into the caster pad and to be quickly removed therefrom by release from the caster pad, said caster including a rectangular caster plate from which a wheel is typically mounted in a yoke, said caster pad comprising in combination;

a base adapted to be attached to the receptacle;

a pair of lateral flanges extending downward from said base and spaced to lie adjacent a first pair of opposite sides of the caster plate when said caster plate is mounted in said caster pad;

a pair of end flanges extending downward from said base and spaced to be adjacent a second pair of opposite sides of the caster plate when said caster plate is mounted in said caster pad, and terminating in lips directed inwardly from the second pair of opposite sides to loosely embrace the second pair of opposite sides so that some space remains between the lips and said caster plate;

one of said pair of lateral flanges extending downward far enough to prevent said caster plate from sliding laterally out of said caster pad when said caster plate is mounted flush against said base, but not so far as to interfere with insertion of said caster plate under said lips to its mounted position in said caster pad;

spring means including legs urged outwardly from the central portion of said caster plate into said space between the lips and said caster plate to hold said caster plate flush against said base.

4,227,282

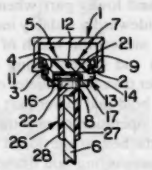
SLIDERS AND RAIL FOR DOOR SUPPORT

James A. Ford, Sherman Township, St. Joseph County., Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed May 22, 1978, Ser. No. 908,057

Int. Cl.[2] E05D *13/02*

U.S. Cl. 16—93 R **1 Claim**



1. In a traverse rod system for supporting a drapery, the combination comprising:

an elongated traverse rod having a downwardly opening slot formed therein and extending longitudinally thereof, said rod having a pair of opposed and inwardly directed flanges defining the opposite sides of said slot;

a drapery hanger slidably supported on said rod for slidable displacement along said slot, said drapery hanger including an upper part which is slidably but nonrotatably supported on said rod within said slot and a lower part which is supported on said upper part for swivelling movement relative thereto about a substantially vertical axis, said lower part depending downwardly from said upper part;

said upper part comprising a substantially rectangular block-like head member positioned slidably but nonrotatably within said slot and on said flanges, said head member having guide means formed on opposite sides thereof for receiving therein said flanges;

a portion of said head member extending below said traverse rod and including sidewardly opening slot means formed therein, said slot means extending at substantially a right angle relative to the direction of movement of said head member along said traverse rod;

said slot means including a first sidewardly opening slot disposed directly below said traverse rod and being spaced upwardly from the lower surface of said head member, said first slot being of a predetermined height and opening outwardly through one side of the head member with the other end of said first slot being closed by a wall defining the opposite side of said head member;

said slot means including a second sidewardly opening slot positioned below, facing in the same direction as, and in axial alignment with said first sidewardly opening slot, said second slot extending between said first slot and the bottom surface of said head member, said second slot also opening outwardly through the same side of said head member as said first slot, the other end of said second slot being closed;

said second slot being narrower than said first slot for providing an upwardly facing support ledge on both sides thereof;

said lower part including an upper substantially cylindrical head fixedly attached to and coaxially aligned with a cylindrical neck which projects downwardly from said head, said head having a height substantially the same as said predetermined height and a diameter greater than the

width of said second slot so that said head when being moved into or removed from said slot means is solely sidewardly slidable and is swivelably supported within the closed end of said first slot due to said head being supported on said ledges, said head when supported within the closed end of said first slot being prevented from upward displacement by a wall on said head member defining the top of said first slot, said cylindrical neck being sidewardly slidably inserted into said second slot and being swivelably supported within the closed end of said second slot, said cylindrical neck projecting downwardly from said second slot beyond the lower surface of said head member;

said second slot adjacent the open end thereof being of a reduced width for creating a snap fit between said head member and said lower part when said cylindrical head and neck are sidewardly slidably inserted into or removed from said slot means, the width of said second slot adjacent the open end thereof being reduced to a spacing which is smaller than the diameter of said cylindrical neck for tending to hold said lower part within said slot means during normal operation of said traverse rod system; and

means fixedly attached to the lower end of said neck for engaging and supporting said drapery.

4,227,283

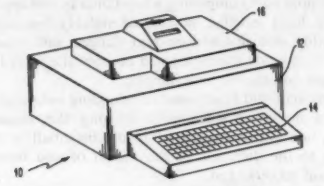
INTEGRAL HINGE STRUCTURE

James A. Mathewson, Raleigh, and Harry Pasterchick, Jr., Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1979, Ser. No. 747

Int. Cl.[2] E05D *9/00*

U.S. Cl. 16—128 R **7 Claims**



1. A hinge structure for providing a concealed, hinged connection between one edge of an inwardly-extending opening in one surface of a base and an adjacent edge of a cover which can be pivoted to a closed position in which it conceals the opening, said hinge structure comprising:

a generally cylindrical strip integral with the base and extending along the one edge thereof within the opening, said strip being spaced from the one edge by an integral web substantially the same length as said cylindrical strip; and

a generally C-shaped strip integral with the cover and extending along the adjacent edge thereof, said C-shaped strip being spaced from the cover by an integral web of substantially the same length as said C-shaped strip with the C opening outward and circumscribing an angle of at least 180° to permit the cover to be secured to the base with the C-shaped strip being concealed from view by the overlying cylindrical strip and integral web when the cover is in its closed position.

4,227,284

BASE OR ADJUSTMENT PLATE FOR CABINET HINGES

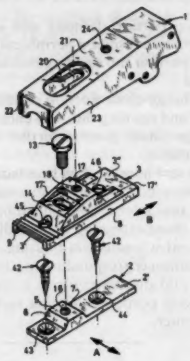
Ernst Zernig, Hemer, Fed. Rep. of Germany, assignor to Firma Richard Heinze GmbH & Co. KG, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,525

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721625

Int. Cl.[2] E05D *7/04*

U.S. Cl. 16—129 **8 Claims**



1. A cabinet hinge base plate permitting adjustable attachment of a hinge arm to a cabinet component, said plate consisting of

(a) an intermediate carrier having upper and lower faces, parallel end faces and parallel side faces, said upper face having defined thereon intermediate to said end faces a guide extension, said guide extension having an upper surface disposed across the width of said carrier and parallel to said upper face and two guide surfaces disposed across the width of the carrier and transverse to said guide extension upper face and said upper surface of said intermediate carrier,

(b) means operable to fix said intermediate carrier to said cabinet component,

(c) a bearing element having a recess defined in its lower surface, said recess being operable to receive said intermediate carrier and having a width greater than the width of said carrier, said bearing element having a pair of bearing surfaces defined within said recess and complementing said guide surfaces so as to permit positioning of said bearing element relative to said intermediate carrier along a first spacial axis parallel to the width of said intermediate carrier, said bearing element further having a pair of longitudinal legs defined on either side of said recess so as to straddle said intermediate carrier, said legs being of such length as to extend to the lower face of said carrier when said carrier is received in said recess,

(d) means operable to fix said bearing element to said intermediate carrier after positioning along said first axis, and

(e) means operable to position said hinge arm along a second spacial axis parallel to the length of said intermediate carrier and to fix said hinge arm to said bearing element after said positioning.

4,227,285

TEXTILE CARD CLEANING APPARATUS

Marvin Hamrick, P.O. Box 603, Rte. 1, Grover, N.C. 28073

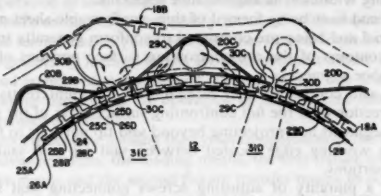
Filed Feb. 2, 1979, Ser. No. 8,547

Int. Cl.[3] D01G *15/82*

U.S. Cl. 19—107 **14 Claims**

1. In combination with a textile card having a main cylinder, a plurality of flats disposed parallel to the longitudinal axis of said main cylinder in an arcuate continuous belt above the

surface of a portion of the circumference of said main cylinder, said belt comprising a lower operative run movable adjacent the surface of a portion of the circumference of said main cylinder so as to form a working space therebetween and a higher inoperative run movable in the opposite direction and in a radially spaced-apart relationship to the lower run, the lower operative run and the higher inoperative run of the continuous belt of flats defining an arcuate open space therebetween, a



card cleaning system for removing cotton dust and lint comprising: a plurality of suction hoods disposed within said arcuate open space adjacent to the lower operative run of said flats and adapted to pull the dust and lint from said arcuate space and from between said flats and the working space therebeneath during the lower operative run thereof; and suction means fluidly communicating with said plurality of suction hoods for removing the cotton dust and lint from the textile card to a remote location.

4,227,286

STRAP TIGHTENER

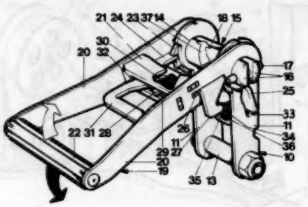
Göte E. Y. Holmberg, Anderstorp, Sweden, assignor to Broderna Holmbergs Fabriks AB, Anderstorp, Sweden

Filed Apr. 26, 1979, Ser. No. 33,521

Claims priority, application Sweden, Apr. 28, 1978, 7804911

Int. Cl.[2] B25B *25/00*; B66D *1/02*

U.S. Cl. 24—68 CD **6 Claims**



1. A strap tightener comprising an element for fixedly anchoring the strap tightener, an operating lever pivoted to the anchoring element, a strap reel mounted coaxially with the pivot axis, at least one ratchet wheel non-rotatably connected to the strap reel, a holding pawl displaceably mounted to the anchoring element, which is spring-biased to engage the ratchet wheel, a driving pawl displaceably mounted to the operating lever, which is spring-biased to engage the ratchet wheel, the operating lever being drivingly connected to the strap reel by means of the driving pawl and the ratchet wheel when being swung in one direction, and being disengaged from the strap reel when being swung in the opposite direction, and means operatively connected to the driving pawl to lock the operating lever in a rest position adjacent to the anchoring element with the holding pawl locked in engagement with the ratchet wheel, said means including a hook projecting from the driving pawl transversely of the path of movement thereof and open towards the pivot axis of the operating lever to receive, in the rest position of the operating lever, the holding pawl at the end thereof which is remote from the ratchet wheel said hook providing a force component transversely of the path of movement of the driving pawl by pressure applied to the holding pawl in a direction away from the ratchet wheel said force component acting towards the rest position of the operating lever.

4,227,287

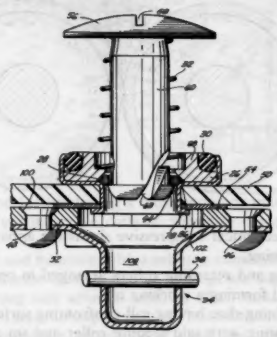
FULL EJECTION STUD ASSEMBLY

Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Dec. 28, 1978, Ser. No. 974,075

Int. Cl.[2] A44B *17/00*

U.S. Cl. 24—221 K **10 Claims**



7. A full ejection stud assembly adapted to be coupled to one member and removably interconnected with a receptacle coupled to a second member to form a fastener assembly for holding the two members together, the stud assembly comprising;

a stud having an enlarged head and a reduced diameter shank extending from one side of the head and having means thereon for interconnecting with a receptacle;

a cup having a through passageway for slidable extension of the shank therethrough;

the cup having mounting means thereon for mounting the cup on the one member in position with respect to an opening in the one member so that the shank of the stud can pass reciprocally therethrough;

retention means on the cup and stud to limit the reciprocal movement of the stud shank through the passageway of the cup and the opening in the one member between a closed position for interconnecting with a receptacle to hold the two members together and an open position free of the receptacle to permit separation of the two members;

spring means normally biased in the closed position with the stud interconnected to a receptacle so as to eject the stud to the open position free of the receptacle when the stud is disconnected from the receptacle;

the retension means including a substantially disc shaped retainer housed in the cup between the undersurface of the head of the stud and an opposing surface in the cup;

the retainer having a central aperture therethrough and the surface surrounding the central aperture having a beveled portion;

a retaining ring in the cup and held in position between the beveled surface of the retainer and an adjacent opposing surface of the cup;

a lateral extension on the end of the shank of the stud distal from the head end; and

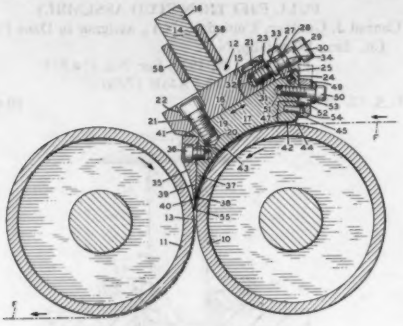
the stud being restricted from full displacement from the cup in one direction by engagement between the lateral extension on the end of the shank and the retaining ring and in the other direction by engagement between the undersurface of the head and the upper surface of the retainer.

4,227,288

COMPACTOR SHOE CONSTRUCTION

Paul Moser, Harrington Park, N.J., assignor to Compax Corp., Woodside, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,346
Int. Cl.[2] D06C *21/00*
U.S. Cl. 26—18.6 **4 Claims**



1. In a mechanical compressive shrinkage apparatus of the type comprising,

(a) feeding and retarding rollers arranged in opposed relation and forming a working nip,

(b) a confining shoe having roll-confronting surface portions cooperating with said feeding roller and tip portions located upstream of said working nip, the improvement in said confining shoe characterized by

(c) a rigid supporting beam extending continuously across the full effective working width of the feeding and retarding rollers in a region generally opposite said working nip,

(d) a plurality of confining shoe segments secured individually to said supporting beam in end-to-end alignment,

(e) a continuous liner element extending over the full working width of the aligned shoe segments,

(f) said liner being formed of thin, conformable sheet material and being pre-contoured to conform generally to the contours of the roll-conforming surface portions of the shoe segments,

(g) said continuous liner extending in a circumferential direction over the full confronting surface areas of the shoe segments and projecting beyond said tip portions to form a working edge located between said nip and said tip portions,

(h) said continuous liner element being secured at its upstream edge,

(i) said liner having an unsecured portion extending downstream from its secured edge, between said feeding roller and said shoe segments,

(j) said rigid shoe-supporting beam being of generally inverted Tee-shaped cross section, including a plate section and an upwardly extending web section,

(k) said plurality of said shoe segments being secured individually to said plate section,

(l) means for adjusting said shoe segments independently with respect to said plate section,

(m) said continuous liner having, adjacent its upstream edge, an upturned flange portion overlying the upstream side edge regions of said shoe segments, and

(n) means securing said flange portion to said side edge regions.

4. In a mechanical compressive shrinkage apparatus of the type comprising,

(a) feeding and retarding rollers arranged in opposed relation and forming a working nip,

(b) a confining shoe having roll-confronting surface portions cooperating with said feeding roller and tip portions located upstream of said working nip, the improvement in said confining shoe characterized by

(c) a rigid supporting beam extending continuously across the full effective working width of the feeding and retarding rollers in a region generally opposite said working nip,

(d) a plurality of confining shoe segments secured individually to said supporting beam in end-to-end alignment,

(e) a continuous liner element extending over the full working width of the aligned shoe segments.

(f) said liner being formed of thin, conformable sheet material and being pre-contoured to conform generally to the contours of the roll-confronting surface portions of the shoe segments,

(g) said continuous liner extending in a circumferential direction over the full confronting surface areas of the shoe segments and projecting beyond said tip portions to form a working edge located between said nip and said tip portions,

(h) a plurality of adjusting screws connecting said shoe segments individually with said supporting beam,

(i) said adjusting screws being individually adjustable to effect precision across-the-width alignment of a plurality of said shoe segments, and

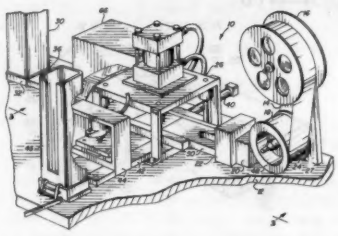
(j) mounting bolts, independent of said adjusting screws, for securely locking said shoe segments to said supporting beam.

4,227,289

AUTOMATION SYSTEM FOR MOUNTING FILM SEGMENTS INTO FIXTURES

Max Avalon; John L. Kowalski, both of Phoenix, and K. Boyd Tippetts, Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jul. 3, 1978, Ser. No. 921,638
Int. Cl.[3] B23Q *7/00*
U.S. Cl. 29—33 K **9 Claims**



1. In combination:

a reel, said reel adapted to have a strip of film having a plurality of equal sized segments wound thereon;

film advance means having a cycle of operation adapted to advance a strip of film a segment at a time during each cycle of operation;

film guide means through which a strip of film is adapted to advance;

loading means having a cycle of operation, said loading means during each cycle of operation adapted to sever a segment, one segment at a time from a strip of film as each segment occupies a predetermined position with respect to the film guide means, and to load a severed segment into a fixture;

a transferor magazine adapted to have a plurality of fixtures stacked in said magazine;

first fixture guide means;

first fixture transfer means having a cycle of operation adapted to remove one fixture at a time from the transferor magazine and moving a fixture so removed into the first fixture guide means during each cycle of operation;

said loading means adapted to load a severed segment into a

fixture occupying a predetermined position with respect to said first fixture guide means during each cycle of operation of the loading means;

second fixture guide means;

second fixture transfer means having a cycle of operation adapted to remove a fixture occupying said predetermined position in said first guide means and to move said fixture into the second fixture guide means during each cycle of operation of said second fixture transfer means;

a transferee magazine removably mounted with respect to the second fixture guide means so that fixtures loaded with segments by loading means are loaded one at a time into said transferee magazine and stacked therein one fixture during each cycle of operation of said second fixture transfer means; and

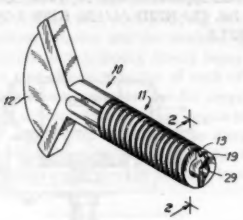
control means for causing the cycles of operation of the film advance means, the loading means, the first fixture transfer means and the second fixture transfer means to occur so that segments from a strip of film are loaded into fixtures and such fixtures are stacked in the transferee magazine.

4,227,290

DRIVE MANDREL FOR HELICAL THREAD INSERTS

Robert P. Wallace, Dean's Corner, Rt. 22, Brewster, N.Y. 10509

Filed May 7, 1979, Ser. No. 36,829
Int. Cl.[3] B23P *19/04*
U.S. Cl. 29—240.5 **6 Claims**



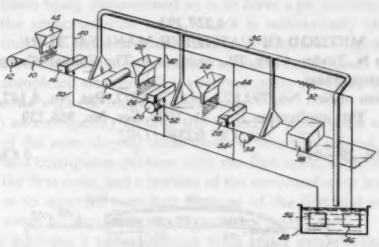
1. An improved drive mandrel for the insertion of helical inserts having drive tangs into tapped bores which are undersized as respects the diameter of said inserts comprising, in combination, an axially elongated, generally cylindrical resilient polymeric body portion including torquing means at one end and a drive insert receiver portion at the other end, said body portion having an external peripheral thread portion for supporting said inserts, said thread portion beginning at said drive end and extending at least part way toward said torque applying end, said thread portion including crests and lands disposed between said crests, the improvement which comprises a substantially radially incompressible metallic drive blade extending axially within said body portion, said blade including a drive tooth projecting axially beyond said drive end of said body portion for engagement with the drive tang of an insert mounted on said threaded portion, said blade including diametrically opposed, axially extending side edges, said side edges being disposed substantially at the level of the said lands for at least the first convolution of said thread portion at said other end whereby radial inward constriction of said first convolution of said insert member is limited by said substantially radially incompressible drive blade.

4,227,291

ENERGY EFFICIENT PROCESS FOR CONTINUOUS PRODUCTION OF THIN SEMICONDUCTOR FILMS ON METALLIC SUBSTRATES

John C. Schumacher, Oceanside, Calif., assignor to J. C. Schumacher Co., Oceanside, Calif.

Filed Jun. 22, 1978, Ser. No. 918,034
Int. Cl.[3] B01J *17/00*
U.S. Cl. 29—572 **5 Claims**



1. A method for producing a semiconductor matrix having an electrically conductive cathode substrate comprising the steps of:

(a) coating said substrate with a solution containing ions of a semiconductor element and an appropriate dopant;

(b) contacting said solution with an alkali metal anode to produce a layer of doped elemental semiconductor on said cathode substrate, generation of alkali ions, and release of energy; and

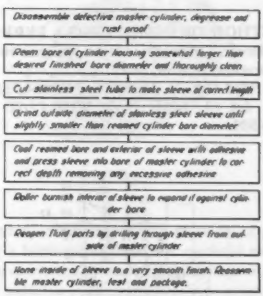
(c) forming a p-n junction by introducing to said elemental semiconductor layer an opposite type dopant.

4,227,292

PROCESS FOR REMANUFACTURING A MASTER CYLINDER

Edward R. Kipling, Dunwoody, Ga., assignor to Rayloc, Atlanta, Ga.

Filed May 4, 1978, Ser. No. 902,944
Int. Cl.[3] B23P *7/00, 15/00*
U.S. Cl. 29—402.04 **3 Claims**


Disassemble defective master cylinder; degrease and rust proof
Ream bore of cylinder housing somewhat larger than desired finished bore diameter and thoroughly clean
Cut stainless steel tube to make sleeve of correct length
Grind outside diameter of stainless steel sleeve until slightly smaller than reamed cylinder bore diameter
Coat reamed bore and exterior of sleeve with adhesive and press sleeve into bore of master cylinder to correct depth removing any excessive adhesive
Roller burnish interior of sleeve to expand if against cylinder bore
Deepen fluid ports by drilling through sleeve from outside of master cylinder
Hone inside of sleeve to a very smooth finish. Reassemble master cylinder, test and package.

1. A method of remanufacturing a brake master cylinder comprising the steps of disassembling a defective brake master cylinder having a housing bore and a lateral port extending through its wall, degreasing the empty brake master cylinder housing, blasting the housing bore of the disassembled cylinder with a solid abrasive to remove rust and corrosion therefrom, rust-proofing the empty cylinder housing, reaming said housing bore to a diameter slightly larger than the desired finished bore diameter of said cylinder making a corrosive resistant metal sleeve of proper length for insertion in said bore, grind-

ing the exterior of the sleeve to a diameter slightly smaller than the diameter of the reamed housing bore, coating said bore and the exterior of said sleeve with adhesive, inserting said sleeve into said bore to a correct depth, removing excess adhesive near the mouth of the bore following said insertion, expanding the sleeve against the surface of the bore by roller burnishing the bore of the sleeve, drilling through the sleeve from the exterior of said housing to reopen said lateral port, and honing the interior of said sleeve to a smooth finish.

4,227,293

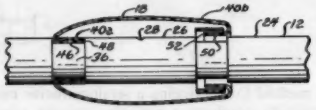
METHOD OF CATHETER MANUFACTURE

Glenn N. Taylor, Cary, Ill., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 792,823, May 2, 1977, Pat. No. 4,147,169. This application Dec. 11, 1978, Ser. No. 968,239

Int. Cl.[3] B23P *11/02*

U.S. Cl. 29—447 **3 Claims**



1. A method of securing a flexible annular balloon on a catheter shaft, comprising the steps of:

forming a pair of spaced annular grooves in an outer surface of the shaft;

positioning a first end portion of the balloon intermediate a first shrinkable annular sleeve and one of said grooves in a configuration with an end edge of the first end portion directed toward the other of said grooves;

shrinking said first sleeve over said first end portion to secure said first end portion of the balloon in said one groove;

positioning the remote end portion of the balloon intermediate a second shrinkable annular sleeve and the other of said grooves in a configuration with an end edge of the remote end portion directed toward said one groove; and

shrinking said second sleeve over said remote end portion to secure said remote end portion of the balloon in said other groove.

4,227,294

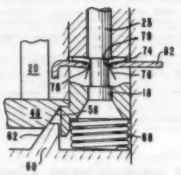
METHOD OF INSTALLING A FERRULE

Robert R. Mercer, Ortonville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 26, 1978, Ser. No. 954,751

Int. Cl.[3] B21D *39/00;* **B23P** *11/00*

U.S. Cl. 29—509 **3 Claims**



1. A method of sequentially cutting out an installation area and fastening a reinforcing member in the cut out area of a panel member composed of a permanently deformable material through use of engageable male and female cutting dies; said male and female dies capable of being mounted on a conventional press so that one of said dies may be advanced toward the other and retracted therefrom; the male die including an annular groove receiving fastening portions of the reinforcing member to be installed in said panel; said male die further including a shank countersinking surface; an abutment surface movable with said male die and positioned for engagement with said female die when one of said dies is advanced toward the other; the female die being normally spring biased to a cutting position and movable to a spring compressed position by said abutment when one of said dies is advanced toward the other; the method comprising the steps of: positioning the panel on said female cutting die; placing a reinforcing member on said male cutting die with its fastening portions in said annular groove; punching a cut out area in said panel by initially advancing one of said dies toward the other moving said male die into said female die; moving said female die against and compressing its biasing spring through engagement of said abutment with said female die; moving said reinforcing member fastening portions through said cut out area as the one said moving die is advanced toward the other; forming a countersink surface in said panel adjacent said cut out as said male die continues movement into said female die engaging its shank countersinking surface with said fastening portions in an interference engagement with the peripheral edges of said cut out; moving said fastening portions outwardly from said male die as said countersink is formed; and securing said reinforcing member to said panel by releasing said female die permitting its biasing spring to rapidly move it into engagement with said fastening portions clenching them on the underneath side of said panel.

4,227,295

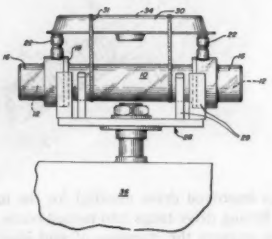
METHOD OF POTTING THE ENDS OF A BUNDLE OF HOLLOW FIBERS POSITIONED IN A CASING

Bert S. Bodnar, Park Ridge, and William J. Schnell, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 888,071, Mar. 20, 1978, abandoned. This application Jul. 27, 1978, Ser. No. 928,477

Int. Cl.[3] B22D *11/126;* **B28B** *1/20*

U.S. Cl. 29—527.3 **9 Claims**



1. The method of potting the ends of a bundle of hollow fibers positioned in a casing, which comprises:

inserting said bundle of hollow fibers into said casing through an open end thereof; sealingly closing the ends of said casing by attaching casing closure member means to said casing; attaching opposed, side-mounted outlet ports of a hollow, elongated potting boat member to side apertures positioned in fluid communication with said casing; placing curable liquid sealant into said hollow, elongated member; and spinning said casing ends about an axis of rotation extending through a central portion of said casing; whereby said liquid sealant migrates by the centrifugal force of said spinning to the interior ends of said casing through said side apertures to pot the ends of the fiber bundle within the casing; and, after said liquid sealant has cured, removing said casing ends and cutting through said sealant and hollow fibers at each casing end to expose the bores of said hollow fibers.

4,227,296

TOOL-CHANGING DEVICE

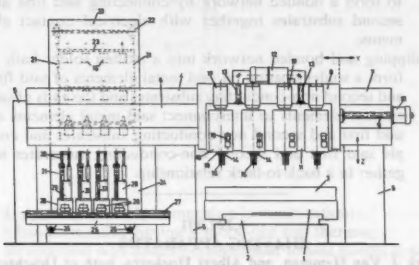
Eduard Wittenbreder, Bielefeld, Fed. Rep. of Germany, assignor to Firma Droop & Rein, Bielefeld and Herr Dipl.-Ing. M. G. Dronsek, Klingen, both of, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,872

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1977, 2739534

Int. Cl.[3] B23Q *3/157*

U.S. Cl. 29—568 6 Claims



1. A tool-changing apparatus for a multiple-spindle milling machine having a workpiece table comprising, a gantry which extends across the workpiece table and on which the individual working spindles are movable side by side together from working positions to a tool change position that is lateral to the workpiece table, a tool-storage unit comprising a plurality of parallel tool pickup devices, each device adapted to hold a tool and a delivery station at which tools are presented to be exchanged arranged on the same side of the workpiece table near the milling machine, whereby said tool-pickup devices are separated from each other by intervals that are smaller than the intervals between said working spindles, a delivery station as part of said tool-storage unit, tool gripping devices movable between said delivery station and the working spindles in the tool-change position each gripping device being turnable and arranged in said tool-change position of each of the working spindles, and separate swinging devices for supporting each of said tool gripping devices, said swinging device being movable relative to one another for changing the distance therebetween, said swinging devices supporting the tool gripping devices which tool gripping devices move at least in the direction of the working spindles.

4,227,297

METHOD FOR PRODUCING A SINGLE TRANSISTOR STORAGE CELL

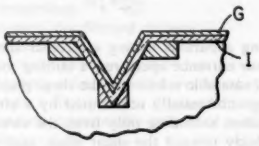
Joerg Angerstein, Flein, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,787

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2738008

Int. Cl.[3] B01J *17/00*

U.S. Cl. 29—571 8 Claims



1. A method for producing a single transistor storage cell, comprising the steps of:

(a) providing a semiconductor body of first conductivity type and having a major surface;

(b) doping a first zone of second conductivity type opposite to the first conductivity type from said major surface into the semiconductor body to a given depth;

(c) doping through a doping mask window on the major surface a second zone of second conductivity type adjacent and having a contiguous portion with the first zone but to a different depth than the first zone, one of the zones being dimensioned so as to form a pn junction with the semiconductor body which is substantially shorter than a pn junction of the other zone after a V-shaped gate recess is subsequently etched so that a capacitance of the completed storage cell is predominantly provided by the zone with the longer pn junction;

(d) anisotropically etching the V-shaped gate recess by use of the same doping mask window into said second zone, said contiguous portion with the first zone, a portion of the first zone, and a portion of the semiconductor body so as to separate unetched portions of the first and second zones by part of the semiconductor body; and

(e) applying a gate insulation layer and a gate electrode in the V-shaped recess.

4,227,298

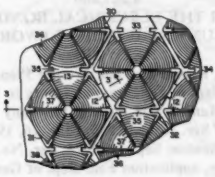
METHOD FOR INTERCONNECTING PHOTOVOLTAIC DEVICES

Michael C. Keeling, Tempe; William L. Bailey, Scottsdale; Michael G. Coleman, Tempe; Israel A. Lesk, Scottsdale, and Robert A. Pryor, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 807,462, Jun. 17, 1977, Pat. No. 4,131,755. This application Sep. 5, 1978, Ser. No. 939,650

Int. Cl.[2] H01R *43/00, 43/04*

U.S. Cl. 29—837 11 Claims



1. A method of interconnecting a plurality of photovoltaic devices using a laminate of dielectric material and of electrically conductive material, comprising the steps of: configuring a plurality of patterns in the electrically conductive material, the patterns having an extended portion; providing a void in the dielectric material over the extended portion; punching a plurality of angled tabs in each pattern through the laminate, the extended portion and the angled tabs formed in a single plane; lifting upward the angled tabs so that photovoltaic devices can be placed on the dielectric material; placing photoelectric devices on the dielectric material; pressing the angled tabs toward the photovoltaic devices so that a portion of the angled tabs comes in contact with the photovoltaic device; bonding the angled tabs to the photovoltaic device; and bonding the extended portion to an adjacent photovoltaic device.

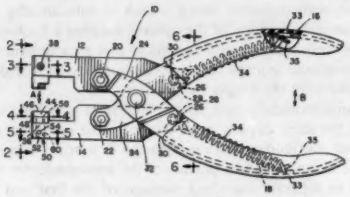
4,227,299
HAND TOOL FOR TERMINAL CONNECTION OF ELECTRICAL CABLE TO AN ELECTRICAL CONNECTOR

Guenter Kuehling, Berwyn, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 935,395, Aug. 21, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,057

Int. Cl.³ H01R *43/04*

U.S. Cl. 29—751 **21 Claims**



1. A hand tool for assembling an insulated electrical cable to a terminal conductor or the like which has a receptacle portion and an insulation piercing contact for receiving the insulated cable, comprising: a pair of handle operated opposing jaws for movement toward and away from each other, one of said jaws having means defining a bearing surface for engaging the terminal connector, and the other jaw having a stuffer portion for engaging the cable and inserting the cable into the insulation piercing contact in the receptacle portion of the connector, and means defining a resiliently yieldable backing member in the form of a cushion pad on at least one of said jaws between the jaw and the respective bearing surface or the stuffer portion providing yielding movement therebetween to accommodate variable sized terminal connectors positioned between the jaws and to prevent damage to the electrical cable due to excess pressure applied when the cable is assembled to the connector, said cushion pad being fabricated of a material providing sufficient back-up to permit the contact to pierce the insulation of the cable but being sufficiently resilient to prevent the contact from damaging the conductive wire of the cable.

4,227,300
METHOD FOR THE ELECTRICAL BONDING OF THIN FILM TANTALUM CAPACITOR NETWORKS TO OTHER NETWORKS

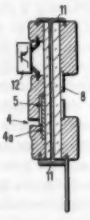
Wilfried Anders, Riemerling, and Werner Piepenburg, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 670,900, Mar. 26, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,151

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513859

Int. Cl.³ H05K *3/34, 3/36*

U.S. Cl. 29—830 **1 Claim**



1. A method for electrically bonding a network including at least one alpha-tantalum capacitor with another network containing at least one other component, such as a tantalum resistor network, including the steps of:

mounting said alpha-tantalum capacitor on a first non-conducting substrate having metal elements;

mounting said other component on a second non-conducting substrate having metal elements;

placing said first and second non-conducting substrates back to back so that said capacitor and said other component are remote from one another;

electrically bonding said capacitor to said other component to form a bonded network by connecting said first and second substrates together with electrical contact elements;

dipping said bonded network into a molten solder bath to form a solder coating on said metal elements of said first and second non-conducting substrates and the ends of said contact elements to interconnect said metal elements on said first and second non-conducting substrates and couple said first and second non-conducting substrates together in a back-to-back relationship.

4,227,301
SHAVING APPARATUS

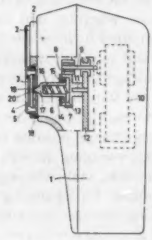
Dirk J. Van Hemmen, and Albert Hoekstra, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

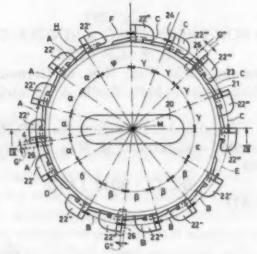
Filed Sep. 28, 1978, Ser. No. 946,512

Claims priority, application Netherlands, Nov. 28, 1977, 7713040

Int. Cl.² B26B *19/14*

U.S. Cl. 30—43.6 **3 Claims**





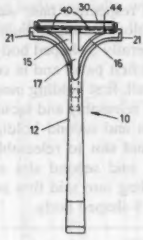
1. A shaving apparatus having a circular shear plate provided with hair-entrance apertures; a cutting member associated with and rotatable relative to the shear plate, said cutting member being substantially constituted by a circular central body; and cutters extending only from the circumference of said central body toward the shear plate, said cutters being arranged in a plurality of groups, the intervals between adjoining cutters of each group being equal, said intervals differing from the respective intervals between the two adjacent cutters of two different groups.

4,227,302

SHAVING APPARATUS

William L. Torrance, 5 Lamont Ave., Agincourt, Canada

Filed Jan. 5, 1979, Ser. No. 1,366
Int. Cl.³ B26B *21/06, 21/54*
U.S. Cl. 30—47 **3 Claims**



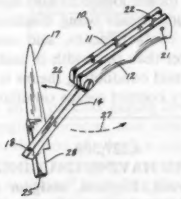
1. A razor assembly comprising in combination:
a handle member having a spoon-like end thereon;
an upturned wall fomed perpendicular to said handle at said end;
a double-edged pair of parallely apart blade members enclosed in a cartridge means exposing the blades for use therefrom and having in said cartridge a pair of oppositely spaced sides adjacent the blade edges;
bearing means situate at the mid-pont of each of said sides;
a Y-shaped spring yoke member adjustably situated within the spoon-like cavity of said handle end;
said Y-shaped yoke comprising two arm members, each having inwardly facing hooks on the ends thereof adapted to mate with the bearings of said cartridge when the yoke arms are sprung outwardly over the cartridge by the pressure of the inside of each yoke arm against the wall at the handle end; and
a push rod integrally formed with the leg of said Y-shaped yoke and reciprocally moveable within an aperture in said handle to and from contact with said wall.

4,227,303

FOLDING KNIFE

Dennis B. Brooker, Des Moines, Iowa, assignor to Brooker Folding Knives, Inc., Des Moines, Iowa

Filed Feb. 23, 1979, Ser. No. 14,605
Int. Cl.³ B26B *1/04*
U.S. Cl. 30—154 **12 Claims**



1. A knife comprising:
a handle having a slot formed therein;
an arm member;
means for pivotally attaching one end of the arm member to the handle along a first axis, said arm member being pivotable between a first position disposed in said slot and a second position substantially outside of said slot;
a knife blade;
means for pivotally attaching one end of the knife blade to the other end of said arm member along a second axis, the second axis being generally transversely disposed with respect to the first axis, said knife blade being pivotable when said first arm member is in the second position thereof between a first position wherein said knife blade is adjacent to said arm member and a second position wherein the knife blade extends away from the arm member.

4,227,304

DEVICE FOR REMOVAL OF ICE FIXED TO ROD OF CONTROL CABLE

Koshiro Okamura, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Oct. 24, 1978, Ser. No. 954,247
Int. Cl.³ B08D *11/00*
U.S. Cl. 30—169 **4 Claims**

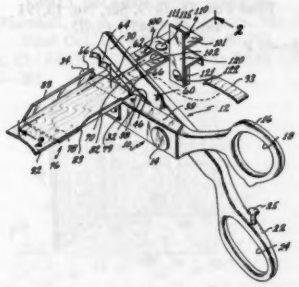
1. A device for the removal of ice fixed to a rod of a control cable, which comprises a tubular fitting having at its opening a deicing surface including at least one sharp-pointed portion and inclined at an acute angle with respect to the axis of the rod, and a rigid guide pipe, the fitting being secured onto the end thereof in which the rod connected to an inner cable of the control cable is slidably disposed.

4,227,305

HAND TOOL FOR CUTTING BLIND STRIPS AND THE LIKE

Jerry C. Newman, 5410 W. 134th St., Hawthorne, Calif. 90250

Filed Mar. 12, 1979, Ser. No. 19,867
Int. Cl.³ B26B *13/10*
U.S. Cl. 30—229 **11 Claims**



1. A tool for cutting blind strips and the like including relatively reciprocatable members, each one of which carries a cutting blade, and means for guiding a strip to be cut to a cutting position, said blade having contoured portions along their length whereby to provide a cut having a corresponding contour at the cut edge of the strip, and guide means to guide said strip accurately to said contoured portions.

4,227,306

UTILITY KNIFE WITH IMPROVED SAFETY FEATURE

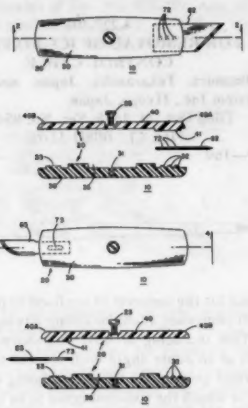
Avram Meshulam, Edison, N.J., assignor to CBS Inc., New York, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,197
Int. Cl.³ B25G *3/00*
U.S. Cl. 30—342 **20 Claims**

1. A utility knife suitable for mounting at least two different types of blades and having an improved safety feature, comprising:

a handle which includes a pair of elongated mateable handle elements, one of said handle elements having a pair of blade-engaging units, one near each end thereof;

blade-securing means disposed near one end only of the other handle element; and



means for removably mating said handle elements with a blade mounted in one of said blade-engaging units, whereby said blade-securing means secures said blade and the absence of a blade-securing means at the other end of said other handle element prevents securing of another blade at said other end.

4,227,307

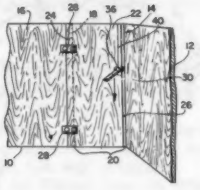
APPARATUS FOR SCRIBING WALL PANELS

Robert Tassoni, 5 Rosewood Dr., Greenville, R.I. 02828

Filed Feb. 21, 1979, Ser. No. 13,791

Int. Cl.[3] B43L *13/02*

U.S. Cl. 33—41 F **7 Claims**



1. In an apparatus for scribing a rough sized second wall panel for insertion into a wall area defined by a first reference line formed by the proximal edge of an already mounted first wall panel and a second reference line spaced therefrom, including jig means for positioning said second panel relative to said wall section such that a first edge thereof is in overlapping relationship with and spaced a predetermined distance from said first reference line and the opposite edge of said second panel is positioned proximal to said second reference line; and scribing means including a reference line follower and a scriber spaced said predetermined distance therefrom for scribing a trim line corresponding to said second reference line along said second panel at a position inwardly spaced from the opposite edge thereof a distance generally equal to said predetermined distance such that the shape of the area of said second panel between said first edge and said trim line is substantially equal to the shape of the said wall area; the improvement comprising, jig means having a generally S-shaped body, first and second open ended longitudinally oriented generally U-shaped slots adapted to receive said proximal edge of said first panel and said first edge of said second panel respectively therein, said slots respectively opening on opposite sides of said jig body, each said slot including a base wall defining the longitudinal extent thereof with said base walls longitudinally spaced said predetermined distance apart from each other, said panel edges received in said slots adapted to abut said base walls, said slots further including opposed inner and outer sidewalls longitudinally extending from respective base walls thereof, the inner sidewall of said first slot forming a flange in turn forming the lower run of said generally S-shaped body, said flange adapted to extend behind said first panel and in contact with both said first panel and said wall, first holding means adapted to extend onto said first slot for releasably and securely holding said first panel in said first slot and second holding means adapted to extend into said second slot to releasably and securely hold said second panel in said second slot said first and second holding means extending into said first and second slots from the same side of said S-shaped body.

4,227,308

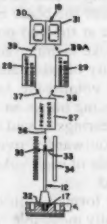
INTERFACE DEVICE

Alan R. Talansky; Herman M. Respess, both of Greensboro, and William A. Borst, Brown Summit, all of N.C., assignors to Tibar Corporation, Reidsville, N.C.

Filed Sep. 15, 1978, Ser. No. 942,743

Int. Cl.[2] G01B *3/28*

U.S. Cl. 33—169 B **18 Claims**



1. A measuring device comprising: a displaceable material contacting means, circuit means engageable with said material contacting means, a display means connected to said circuit means, a first and a plurality of secondary electrical contact means included within said circuit means, said secondary contact means being uniformly spaced from each other the width of said secondary contact means and spaced from said first contact means, said secondary contact means being of uniform width, a conducting means joined to said material contacting means, said conducting means being displaceable along said first and secondary contact means, said conducting means having a width greater than the width of said secondary contact means whereby said conducting means is capable of contacting two secondary contact means simultaneously.

4,227,309

PIPELINE PIG HAVING GAUGING PLATE

Trevor C. Jones, Stroud, England, assignor to Underground Location Services Limited, Gloucestershire, England

Continuation of Ser. No. 630,502, Nov. 10, 1975, abandoned. This application Apr. 6, 1977, Ser. No. 785,073

Claims priority, application United Kingdom, Dec. 21, 1974, 55359/74

Int. Cl.[3] G01B *7/12, 7/28*

U.S. Cl. 33—178 E **12 Claims**

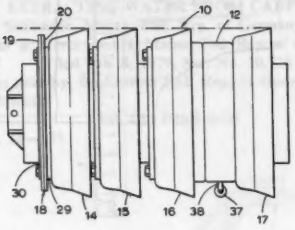
1. A pipeline pig movable along a pipeline for detecting surface projections on the internal wall thereof which reduce the nominal internal cross-section of the pipeline by more than a predetermined amount comprising:

a pig body

a flexible disc of dimensions less by said predetermined

amount than the nominal internal cross-section of the pipeline, said disc being mounted in its central region on said pig body so that the planar circular surfaces of said disc lie generally parallel to the cross-section of the pipeline;

circular supporting means mounted on, and extending radially from, said pig body coaxially with said disc and having a radius larger than said disc for supporting said pig



body in the pipeline with said disc substantially coaxial with the pipeline;

a plurality of strain gauges secured to the peripheral region of said disc, said strain gauges being radially orientated outwardly with respect to the center of the disc; and

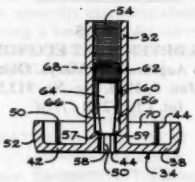
circuit means coupled to the plurality of strain gauges and electrically responsive thereto for detecting bending of the peripheral region of said flexible disc responsive to striking internal surface projections.

4,227,310

HEADS FOR GAGING DEVICES AND FIXTURE FOR SETTING SAME

Frank E. Vanderwal, Jr., St. Louis, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Mar. 27, 1978, Ser. No. 890,127
Int. Cl.³ G01C *3/34*
U.S. Cl. 33—178 R **15 Claims**



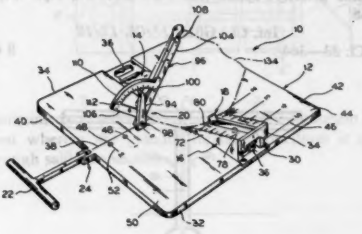
1. A head for an in process gaging device comprising integral tube and gaging portions, said tube portion having first and second ends, the first of which is connected to the gaging portion, said tube portion having internal threads over a portion of the length thereof including the portion adjacent the second end, axial extending groove means dividing the gaging portion and the adjacent first tube end portion into at least three spaced segments capable of being deflected radially with respect to the tube portion, means forming an annular segmented adjustment edge in the tube portion inwardly of the gaging portion, each of said segments of the gaging portion having an outer peripheral flange portion with a work engaging surface which surfaces establish the gaging diameter of the head, and an adjustment member having a first portion threadedly engageable with the internally threaded portion of the tube portion and a second axially tapered portion cooperatively engageable with the annular segmented adjustment edge in said tube portion whereby rotation of said adjustment member axially displaces the axially tapered second portion to change the gaging diameter.

4,227,311

METHOD AND APPARATUS FOR ALTERING AN EQUINE LEG CONFORMATION

Charles A. Behney, Box 4337, Bisbee, Ariz. 85603

Filed Feb. 28, 1979, Ser. No. 16,280
Int. Cl.³ A01L *11/00*
U.S. Cl. 33—195 **17 Claims**



1. Apparatus for use in altering an equine leg conformation and which comprises:

a base providing a supporting surface for an equine hoof,

means on the base for bracing the hoof against shifting movement, and

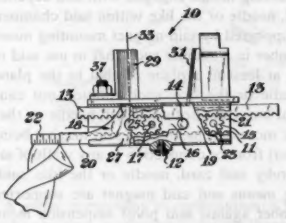
a wedge advanceable on the base in the direction of the bracing means to wedge the hoof for tilting it with respect to the supporting surface into an attitude which serves to provide a desired altered leg conformation.

4,227,312

DRILL SHARPENING GAUGE

Wilbur A. Marshall, Rt. 2, Box 96 C., Aurora, Mo. 65605

Filed Oct. 1, 1979, Ser. No. 80,707
Int. Cl.³ G01B *5/02;* **B27G** *23/00;* **B23B** *3/00*
U.S. Cl. 33—201 **4 Claims**



1. A drill point gauge comprising a first rack and a second rack, said racks being opposed and cooperatively engaging two pinions spaced apart in the same place and positioned in a rectangular carriage, comprising two opposed plates, said pinions being individually mounted between said plates on individual stationary axes affixed between said plates and being adapted to rotate on said axes in cooperation with a stationary and a moving rack; said carriage, pinions and racks being positioned in a rectangular housing, having a bumper blade adjustably affixed thereto at any desired angle from the longitudinal axes thereof, said first rack being held stationary in said housing and said second rack and said carriage being movable with respect to said housing and said first rack, said first rack having an extended end portion without teeth and displaying a measuring section and one plate having an extended finger portion operating parallel and adjacent to a portion of the first

rack, said second rack being adapted to move a jaw blade which is adapted to cooperate with said bumper blade to measure the width of a drill at a given angle while said extended finger portion measures the length of one cutting edge of said drill on said extended end portion.

4,227,312

COMPASSES

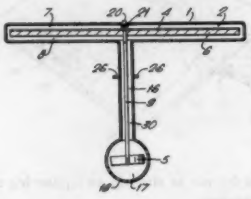
John B. Hennessy, Ahuroa, North Auckland, New Zealand

Filed Apr. 12, 1978, Ser. No. 896,014

Claims priority, application New Zealand, Apr. 14, 1977, 183868

Int. Cl.³ G01C *17/08, 17/18*

U.S. Cl. 33—364 **8 Claims**



1. A compass comprising:

an enclosed chamber;

a flat card, needle or the like positioned within said chamber;

said chamber comprising a cylinder having upper and lower end walls;

pivot suspension means, operably connected between said card, needle or the like and said upper end wall of said cylinder, for allowing said card, needle or the like to pivot within said cylinder about an axis perpendicular to said card, needle or the like;

said chamber containing therein liquid means for floating said card, needle or the like within said cylinder and for causing said card, needle or the like to rise upwardly against said pivot suspension means;

magnet mounting means engaged with and depending from said card, needle or the like within said chamber;

a magnet supported by said magnet mounting means within said chamber in a manner such that in use said magnet is rotatable at least in a plane normal to the plane of said card, needle or the like, such rotation not causing any substantial movement of said card, needle or the like;

said magnet mounting means and said magnet being free of any support from or connection to any walls of said chamber, whereby said card, needle or the like, said magnet mounting means and said magnet are supported within said chamber against said pivot suspension means solely by said liquid means;

said upper and lower end walls of said cylinder being positioned and dimensioned such that in directions normal to the plane of said card, needle or the like there are small clearances between said card, needle or the like and said end walls, whereby said end walls form means for limiting any tilting movement of said card, needle or the like with respect to said axis; and

said chamber further comprising an extension depending from the mid point of said cylinder, said magnet mounting means extending from said card, needle or the like into said extension, said magnet being pivotally affixed to said magnet mounting means, and the dimension of said extension being such that the diameter of said extension in a plane substantially parallel to the plane of said card, needle or the like is substantially less than the diameter of said cylinder in the plane of said card, needle or the like.

4,227,314

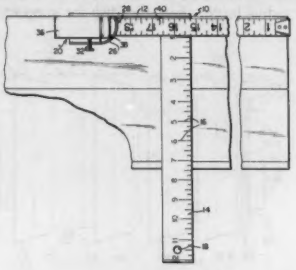
CARPENTER SQUARE WITH TAPE HOLDER

Edward Schliep, 3218 Twin City Dr., Mandan, N. Dak. 58554

Filed Feb. 22, 1979, Ser. No. 14,181

Int. Cl.³ B43L *7/08*

U.S. Cl. 33—480 **6 Claims**



1. A carpenter square with tape holding means comprising:

(a) a square having first and second legs arranged perpendicular to each other,

(b) a tape holding section mounted on one of said legs, said tape holding section comprising a flat base on which the tape housing is supported, a straight side wall portion spaced from and parallel to said one leg, a curved portion which interconnects said side wall portion and said one leg, said curved portion having therebelow a slot the bottom of which is in the same plane as said base so that a tape can be directed through said slot for measuring purposes, whereby tapes having different size housings can be inserted between said one leg and said side wall portion, in contact with said one leg, and the leading edge of such a housing moved into contact with said curved portion to position such housing in contact both with said curved portion and said leg, and

(c) means carried by said side wall portion for contacting the adjacent side of such tape housing positioned as aforesaid for holding such tape housing in such position.

4,227,315

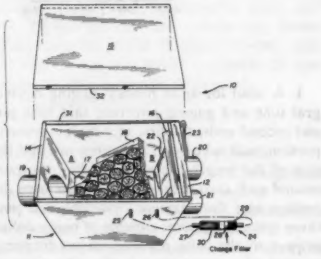
CLOTHES DRYER HEAT ECONOMIZER

Jesse G. Hight, 313 Augustus, St. Marys, Ohio 45885

Filed Jun. 8, 1978, Ser. No. 913,594

Int. Cl.³ F26B *11/04*

U.S. Cl. 34—82 **2 Claims**



1. A filter unit for use with a clothes dryer comprising a five sided housing with an open top, a cover having down-turned portions for closing said top, opposite sides of said open top having out-turned portions for receiving said down-turned portions of said cover, flange means on the top of said housing for retaining said cover on said housing, supports located at the far opposite ends of the housing for supporting a filter element

in a slanting position, said filter element and housing forming first and second chambers, a second means adapted for connecting the exhaust of a clothes dryer to said first chamber, third and fourth means connected to said second chamber for conducting air from said second chamber, fifth means for alternatively closing said third or fourth means.

4,227,316

DISCHARGE DUCT FOR APPARATUSES FOR EXTRACTING WATER FROM CARPETS

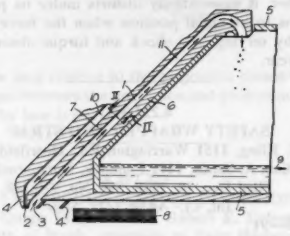
Helmut Schneider, Mainz, Fed. Rep. of Germany, assignor to Werner & Mertz GmbH, Mainz, Fed. Rep. of Germany

Filed Feb. 8, 1979, Ser. No. 10,718

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806681

Int. Cl.³ F26B *9/00*

U.S. Cl. 34—151 **11 Claims**



1. An apparatus for extracting liquid from a wetted carpet by blowing gas through the carpet, which comprises

a gas duct for blowing gas through the carpet and which has a gas exit slot at the lower end thereof;

a discharge duct for discharge of a gas/liquid mixture from the carpet and having at a lower end an entry slot adjacent said gas exit slot and an upper end communicating with a liquid container, the discharge duct having an overall cross-section substantially the same as the cross-section of the entry slot;

means subdividing said discharge duct into a plurality of separate upwardly extending channels, each of said channels having a base which is curved in cross-section, the channels being inclined at an angle not greater than 60° with respect to the horizontal.

4,227,317

APPARATUS FOR THE HEAT TREATMENT OF TEXTILES

Hans Fleissner, Egelsbach bei Frankfurt am Main, Fed. Rep. of Germany, assignor to Vepa Aktiengesellschaft, Fed. Rep. of Germany

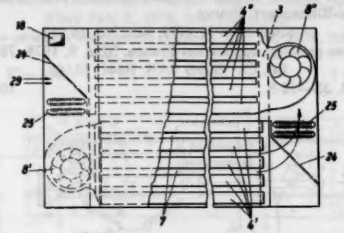
Division of Ser. No. 768,382, Feb. 14, 1977, Pat. No. 4,137,649, which is a continuation of Ser. No. 463,146, Apr. 22, 1974, abandoned. This application Jun. 28, 1978, Ser. No. 919,839

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1973, 2320479; Apr. 21, 1973, 2320480; Apr. 21, 1978, 2320481; Nov. 17, 1973, 2357459

Int. Cl.³ F26B *13/10*

U.S. Cl. 34—155 **26 Claims**

1. An apparatus for the heat treatment of textiles, especially for the heat treatment of a passing length of material extending in a plane, which comprises a plurality of sections of nozzle boxes extending across the operating width at least on one side of the length of the material, said nozzle boxes being fed from a front face and having openings discharging in a direction toward the length of material, a fan being disposed at the feed end of these nozzle boxes for introducing a gaseous treatment medium into said nozzle boxes, said fan being a radial-flow fan and being arranged, with its axis of rotation, at right angles to the plane of the length of material on a longitudinal side of the apparatus, two sections of said nozzle boxes and associated radial fans being arranged adjacent to each other in a mirror-image transpositional relationship and being disposed in series



communication with each other to form a treatment compartment wherein the gaseous treatment medium is circulated through said two sections.

4,227,318

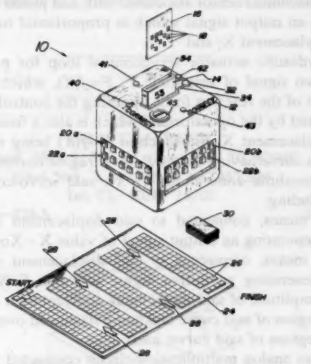
A QUIZ GAME WITH RESPONSE INDICATION FOR CORRECT AND INCORRECT ANSWERS

Calvin Mims, 427 N. Ridgeland Ave., Oak Park, Ill. 60302

Filed Feb. 21, 1979, Ser. No. 12,970

Int. Cl.³ G09B *7/06*

U.S. Cl. 35—9 B **8 Claims**

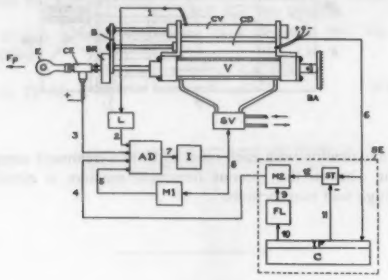


1. A game, comprising in combination: a multi-sided hollow game box having an opening in the top thereof; a set of selector switches arranged in a row on each side of said game box; a set of indicators arranged in a row on each side of said game box, said selector switches and said indicators being in registry with one another; means in said opening for receiving a game card; a game card having coded information thereon for energizing selective ones of said indicator in each of said sets of indicators, said game card having questions printed thereon to be answered by actuating at least one of the selector switches in said set of selector switches, and code reader means within said hollow game box to read the coded information on said game card and provide an indication of the correct answer to the question on said game card, whereby alignment of an energized selector switch and an energized indicator will indicate a correct answer, and misalignment of an energized selector switch and and energized indicator will indicate a wrong answer.

4,227,319
FLIGHT-CONTROL ELECTRO-HYDRAULIC SIMULATOR

Bernard F. R. Guy, Versailles, and Michel A. B. Lacroix, Velizy, both of France, assignors to Le Materiel Telephonique, Boulogne-Billancourt, France

Filed Mar. 5, 1979, Ser. No. 16,963
Claims priority, application France, Mar. 9, 1978, 78 06832
Int. Cl.³ G09B *9/08;* **B64C** *13/46*
U.S. Cl. 35—12 S **10 Claims**



1. An electro-hydraulic control simulator for generating a reaction force for a control which is displaced by an operator, which comprises:

a double-action, hydraulic actuator including a piston which moves an amount X which is proportional to the displacement of said control by said operator;

a displacement sensor associated with said piston for producing an output signal which is proportional to the piston displacement X; and

an hydraulic actuator servocontrol loop for producing a servo signal of amplitude F, $F=f(X)$, which represents part of the reaction force opposing the control force generated by the operator and which is also a function of the displacement X, the function $F=f(X)$ being represented by a curve having a central linear region corresponding to a threshold zone about $X=Xo$, said servo-control loop including:

(a) means, connected to said displacement sensor, for generating an output signal of value X−Xo;

(b) means, connected to said displacement sensor, for generating an output signal of value F/X−Xo, the amplitude of said signal being constant over the central region of said curve and being staircased over the outer regions of said curve; and

(c) an analog multiplication circuit connected to the outputs of said X−Xo and F/X−Xo signal generating means for performing an analog multiplication thereof.

4,227,320
CUSHIONED SOLE FOR FOOTWEAR

Alexander T. Borgeas, 129 W. Catalina Dr., Phoenix, Ariz. 85013

Filed Jan. 15, 1979, Ser. No. 3,535
Int. Cl.² A43B *7/14, 13/20, 13/40, 19/00*
U.S. Cl. 36—88 **11 Claims**

1. An insert for covering at least a part of the sole position of footwear comprising:

a pad portion,

said pad portion comprising a relatively flat sole engageable member having a circular aperture therein,

a resilient tubular member secured within said aperture in said flat sole engageable member in a coiled configuration substantially flush with the flat engaging surface of said sole engaging member,

said tubular member comprises a hollow configuration filled with a fluid material and

means for anchoring the pad to the sole portion of the footwear used,

whereby when the sole of a user is applied to said tubular member, it momentarily distorts under its pressure and returns to its initial position when the force is changed thereby serving as a shock and torque absorber for the footwear.

4,227,321
SAFETY WRAPPER AND STRAP

Stephen C. Kling, 1151 Warrington Rd., Deerfield, Ill. 60015, and William A. Sands, 1441 Paddock, Northbrook, Ill. 60062

Filed Dec. 18, 1978, Ser. No. 970,240
Int. Cl.² A43B *7/22, 5/04*
U.S. Cl. 36—91 **2 Claims**

1. A device of the class described for lessening injury by over-dorsiflexion of the foot and leg of a wearer during certain gymnastic maneuvers comprising a main elongated body having angular ends and a lower side, means for securing the ends together, an elongated tongue anchored to one end of the body on the lower side with the remaining portion extending outwardly, an elongated strap anchored at one end to said lower side of said body medially of the ends of the body with the remaining portion extending outwardly from said body where anchored, whereby said body is secured to the mid-foot of the wearer and the strap extends around the heel of the foot and upwardly along the leg and is removably anchored thereto while the heel is slightly elevated.

4,227,322
SPORT FOOTWEAR OF INJECTED PLASTICS MATERIAL

Giuseppe Annovi, Montebelluna, Italy, assignor to Dolomite, S.p.A., Treviso, Italy

Filed Oct. 13, 1978, Ser. No. 950,999
Int. Cl.² A43B *5/04, 11/00*
U.S. Cl. 36—117 **7 Claims**

1. Sporting footwear, such as mountain footwear, hockey or training footwear, comprising an upper of injected plastics material having a front opening formed by a pair of flaps, projection means integrally formed on the flaps from the same injected plastics material and being engageable with crossed lacing operable to hold the front opening of the footwear

closed, and separate protrusion means integrally formed on the flaps from the same injected plastics material near the projection means and coacting with the projection means to hinder

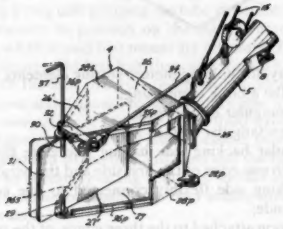
sliding of the lace relative to the projection means when the lace is engaged between the projection and protrusion means at least when the lace is slackened.

4,227,323

HYDRAULIC DREDGE SUCTION DIVERSION FLAP

Thomas O. Quigg, Hoquiam, and Robert E. Delegard, Montesano, both of Wash., assignors to Twin Harbor Dredging Co., Aberdeen, Wash.

Filed Jan. 20, 1978, Ser. No. 871,106
Int. Cl.³ E02F *3/92*
U.S. Cl. 37—58 **7 Claims**



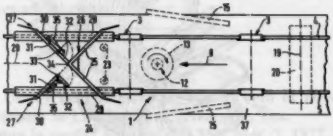
1. In a dredge including a suction head swingable along the bottom of a body of water, such head having opposite sides and upper and lower lips between such sides forming an end-opening mouth therebetween through which material is sucked, the improvement comprising a suction pipe connected to such head remote from the head's end-opening mouth and the head being symmetrical about an upright plane bisecting the suction pipe connection, upright pivot means carried by the outer portions of said lips in the plane of symmetry of the head, an upright flap swingably mounted by said pivot means for swinging through the plane of symmetry of the suction head to alternative extreme positions at opposite sides, respectively, of said plane of symmetry, said flap having an inner portion and an outer portion at opposite sides of said pivot means, respectively, in coplanar relationship, said flap inner portion extending inward from said pivot means a distance sufficient for engagement with a selected one of the head sides to limit outward swinging of the inner portion of the flap and said flap outer portion projecting outward from said pivot means a distance less than the inward extension of said inner portion from said pivot means for scooping material to be sucked into the suction head mouth.

4,227,324

MOBILE APPARATUS FOR DISTRIBUTING AND SHAPING BALLAST OF A RAILROAD BED

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Feb. 5, 1979, Ser. No. 9,592
Claims priority, application Austria, Apr. 28, 1978, 3180/78
Int. Cl.³ E02F *5/22*
U.S. Cl. 37—104 **7 Claims**



1. A mobile apparatus for distributing and shaping ballast of a railroad bed whereon there are supported two track rails, comprising

(a) a frame and

(b) a ballast plow arrangement vertically adjustably mounted on the frame, the plow arrangement including

(1) a V-shaped central plow consisting of two plow blades rigidly interconnected at an apex of the central plow,

(2) a side plow associated with each one of the track rails, each one of the side plows having a single ballast guide blade adjustable between the track rails and having an effective operating length extending to the apex of the central plow, and

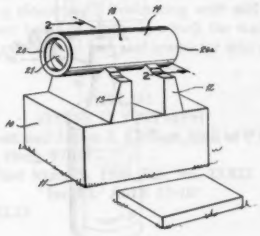
(3) a tunnel-shaped element extending over and covering each one of the track rails.

4,227,325

GRAVE MARKER

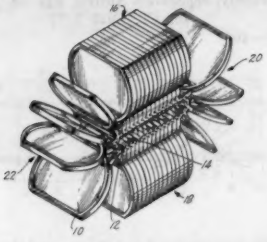
Leon Whitford, 1015 S. 5th St., Greenville, Ill. 62246

Filed Nov. 3, 1978, Ser. No. 957,524
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—124.5 **5 Claims**



1. A grave marker comprising a base and a horizontally extending, elongate chamber mounted on said base, retaining means spaced from the ends of said chamber for holding a picture or the like in a position disposed within a plane extending longitudinally within the chamber and spaced from the ends of the chamber in facing relation to a side wall of the chamber, said chamber having through said side wall a view port aligned with the picture or the like and there being lens means sealing said view port for viewing said picture or the like, and indirect light transmitting means closing at least one end of said chamber for passing sunlight into said chamber without direct impingement upon said picture or the like.

4,227,326
AMUSEMENT DEVICE
Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94306
Filed Nov. 28, 1978, Ser. No. 964,198
Int. Cl.[3] G09F *11/14*; G03B *25/00*
U.S. Cl. 40—527 **24 Claims**

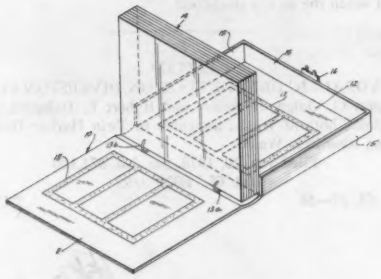


1. An amusement device comprising:
a plurality of thin, planar segments, each segment having a pair of opposed faces, an elongated base portion defining one edge of the planar segment and an elongated flat edge located at the side of the segment opposite the base portion;
rib and socket means on the base of each segment for press fit engagement of the base portion of one segment with adjacent segment base portions, said rib and socket means pivotally interconnecting adjacent segments thereby defining an axis of rotation of said segments between a position of face to face abutment and a position of angular separation of adjacent segments; and
means on each segment for preventing translation of engaged segments along the axis.

4,227,327
SOLAR SIGN ASSEMBLY
Marion E. Thompson, P.O. Box 460, Colorado Springs, Colo. 80901
Filed Apr. 11, 1979, Ser. No. 30,608
Int. Cl.[3] G09F *11/12*
U.S. Cl. 40—473 **16 Claims**

1. An assembly comprising
a base;
a d.c. motor mounted in said base and completely surrounded thereby, said motor having a shaft;
a solar cell;
means for operatively connecting said solar cell to said base while providing electrical interconnection between said cell and said motor;
a sign member having a substantially planar surface with word indicia formed thereon;
an elongated shaft-like member operatively connected to said sign member and elongated in a plane substantially coincident with or parallel to said sign member planar surface;
means for interconnecting said sign member shaft-like member and said motor shaft so that said motor rotates said sign member with respect to said base when incident radiation of sufficient intensity strikes said solar cell;
said d.c. motor normally rotating its shaft at a speed too fast for normal recognition of the word indicia on said sign member; and
the area of said sign member being chosen, and said means for interconnecting said sign member shaft-like member and said motor shaft being so constructed, that said sign member rotates at a speed, slower than the motor shaft, appropriate for normal recognition of the word indicia on said sign member.

4,227,328
DISPLAY DEVICE
Eddie L. Clipper, Jr., 686 Lafayette Ave., Brooklyn, N.Y. 11216
Filed Jul. 24, 1978, Ser. No. 927,387
Int. Cl.[3] G09F *19/00*
U.S. Cl. 40—530 **7 Claims**



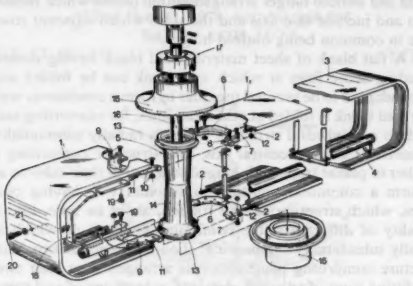
1. A display, for holding picture storing elements, of the type that opens like a book comprising:
a first rectangular display side;
a second rectangular display side;
a rectangular backing side having one edge flexibly connected to one edge of the first side and the parallel edge of the backing side flexibly connected to one edge of the second side;
a wall portion attached to the three edges, of the second side, that are not connected to the backing side, said wall being perpendicular to the plane of the side whereby the wall and sides form a closed receptacle when the first side is folded over the second side;
means for attaching a plurality of picture storing elements to the backing side, said means for attaching are positioned such that the picture storing elements are within the receptacle when the first side is folded over the second side, said means of attaching permit rotation of the picture storing elements from a position atop the first side to a position atop the second side;
fastening means on the first and second sides for removably attaching display elements to the first and second sides, such that the display can be within the closed receptacle;
the display element attached to the first side comprising:
two rectangular sheets sealed along three sides whereby forming a storage pocket between the sheets;
and a plurality of pockets attached to the front sheet that is not fastened to the first side;
and the display element attached to said second side comprising:
a rectangular storage box;
and a plurality of pockets attached to the front face opposite to the face attached to the second side.

4,227,329

SIGN POST

Jean-Claude Decaux, 53 Av. du Mal Lyautey, 75016 Paris, France

Filed Oct. 31, 1978, Ser. No. 956,377
Claims priority, application France, Dec. 7, 1977, 77 36825
Int. Cl.[3] G09F *15/00*
U.S. Cl. 40—607 4 Claims



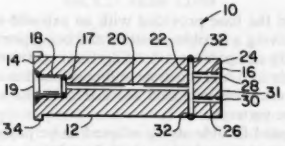
1. In a sign post comprising a supporting tube structure having a longitudinal axis, at least an elongated box structure which comprises a first half-shell and a second half-shell, the half-shells being engaged with the tube structure on opposite sides of the tube structure and having a joint line substantially contained in a plane which contains said axis and is transverse to the length of the box structure, first half-rings associated with the first half-shell and second half-rings associated with the second half-shell, first fixing means fixing the first half-rings to the first half-shell, second fixing means fixing the second half-rings to the second half-shell, and third fixing means fixing the first half-rings to the second half-rings to form substantially a ring unit gripping the tube structure and holding the box structure in position on the tube structure; the improvement wherein said first means are releasable from outside the box structure, said first half-rings and second half-rings are engaged with the tube structure on opposite sides of said plane and are shaped and disposed to be withdrawable from the tube structure transversely of said plane, said third fixing means are releasable laterally of said axis and accessible from the side of said plane adjacent to the first half-shell and the tube structure has at least an upwardly facing abutment surface against which surface first and second half-rings bear axially downwardly of the tube structure.

4,227,330

BREECH-LOADING TO MUZZLE-LOADING FIREARM CONVERTING DEVICE

Paul D. Chapin, 1936 Fifth St., Ceres, Calif. 95307

Continuation-in-part of Ser. No. 822,493, Aug. 8, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,614
Int. Cl.[3] F41C *21/10*
U.S. Cl. 42—77 13 Claims



1. A device for installation in the breech of a breech-loading firearm to convert said firearm to one of a muzzle-loading variety, comprising:

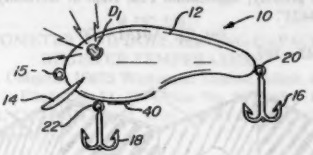
an elongate body member having an outer surface that is conformably shaped for mating engagement with the interior of the breech of the firearm and having a pair of opposed ends, the body member being formed with a primer-receiving chamber at one end and means for establishing communication between the primer-receiving chamber and the opposite end, the communicating means including a passageway to the primer-receiving chamber, at least a pair of generally parallel, non-axial passages to the opposing end, and an intermediate passage establishing communication between each one of the pair of non-axial passages and the axial passage.

4,227,331

FISH LURE

Curtis W. Ursrey, and Richard L. Tillery, both of Hemphill, Tex., assignors to Lite-Bait, Inc., Hemphill, Tex.

Continuation-in-part of Ser. No. 774,853, Mar. 7, 1977. This application Mar. 7, 1978, Ser. No. 884,359
Int. Cl.[3] A01K *85/01*
U.S. Cl. 43—17.6 4 Claims



1. A fishing lure comprising:

a lure body,

at least one light emitting diode light source rigidly secured to and protruding outwardly from said body, said light emitting diode being of a type which emits a green light having a peak emission wave length between about 550 to about 575 nm,

power supply means disposed internally of said body for energizing said light source,

hook means secured to said body, and

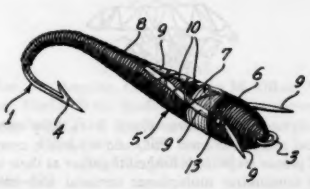
a solid state, electronic water sensor means including a transistor and connected to said power supply and said light source, said water sensor means serving to automatically energize said light source when said lure is in contact with water, said water sensor means comprising at least two sensing elements for contacting with said water, said water sensor being of a type in which the water acts as a resistance effective to bias said transistor into conducting.

4,227,332

STONE FLY NYMPH

Percy P. Crofoot, and James A. Crofoot, both of P.O. Box 130, Silver Lake, Oreg. 97638

Filed Mar. 26, 1979, Ser. No. 23,822
Int. Cl.[3] A01K *85/08*
U.S. Cl. 43—42.25 8 Claims



1. In a nymph including a hook having an eye and a yarn body wrapped around the hook shank, the improvement com-

prising two narrow strips of buoyant material secured outside the yarn body, each of said strips being at least several times greater in length than in width and extending generally longitudinally of and above the hook shank, said strips diverging forward and outward from the hook shank, resembling antennae, and in contact with water when the nymph is placed in water for maintaining the hook with its barbed end substantially directly below its shank.

4,227,333

METHOD FOR THE EARLY DETECTION, LOCALIZATION AND CONTROL OF KHAPRA BEETLES AND THEIR LARVAE, AND AN ODOR, TASTE AND/OR CONTACT-RESPONSIVE TRAP FOR CARRYING OUT THE METHOD

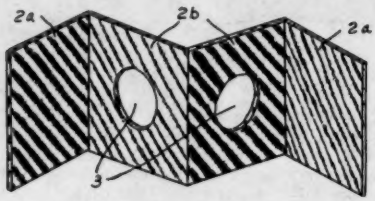
Hermann Levinson; Anna-Rose Levinson, both of Oberholzstrasse 4, 8131 Starnberg, Fed. Rep. of Germany; Wendell Burkholder, University of Wisconsin, Madison, Wis. 53706; Robert M. Silverstein, and Robert Cassidy, both of State University of N.Y., Syracuse, N.Y. 13210

Filed Sep. 28, 1977, Ser. No. 837,648

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644217

Int. Cl.³ A01M *1/00*

U.S. Cl. 43—107 **1 Claim**



1. A contact and odor responsive device for trapping Khapra beetles and their larvae comprising in combination a feed luring means, a synthetic pheromone and a lethal means contained within a trap constructed of a corrugated paper board strip, which is folded together to form two cover sections and two center stations provided with recesses in a manner such that the recesses of the center sections define an inner cavity.

4,227,334

POLYHEDRAL ANNULAR STRUCTURES, AND BLANKS THEREFOR

Rea F. Hooker, 170 W. 74 St., New York, N.Y. 10023

Filed Jan. 10, 1978, Ser. No. 868,328

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

Int. Cl.³ A63H *33/16*

U.S. Cl. 46—1 L **10 Claims**

1. A polyhedral structure which is radially substantially symmetrical about a central axis, said structure comprising a number of planar trapezoids hinged together at their sides so as to form a continuous multiplanar toroidal web having two edges, which structure can be rotated, about its core, into a plurality of different stable configurations each of which is radially substantially symmetrical about said central axis, said structure comprising plane elements arranged in at least two interfitting rows of adjacent elements, at least one of said rows being a trapezoid-row which is a ring of single trapezoids arranged in alternation so that each trapezoid has a hinged longer side in common with one of its two neighbors of its row and has a hinged shorter side in common with the other of its neighbors of its row, said rows interfitting so that each of said trapezoids of said trapezoid-row has a side in common with a plane element of the adjacent row, the longer and shorter common sides within said trapezoid-row being respectively, infold and outfold hinges arranged within planes which radiate from and include said axis and the sides which adjacent rows have in common being outfold hinges.

5. A flat blank of sheet material, said blank having means, including score lines at which said blank can be folded and edges adapted to be secured together to form a continuous web after said blank is folded at said score lines, for converting said blank to a polyhedral structure which is radially substantially symmetrical about a central axis, said structure comprising a number of planar trapezoids hinged together at their sides so as to form a continuous multiplanar toroidal web having two edges, which structure can be rotated, about its core, into a plurality of different stable configurations each of which is radially substantially symmetrical about said central axis, said structure comprising plane elements arranged in at least two interfitting rows of adjacent elements, at least one of said rows being a trapezoid-row which is a ring of single trapezoids arranged in alternation so that each trapezoid has a hinged longer side in common with one of its two neighbors of its row and has a hinged shorter side in common with the other of its neighbors of its row, said rows interfitting so that each of said trapezoids of said trapezoid-row has a side in common with a plane element of the adjacent row, the longer and shorter common sides within said trapezoid-row being respectively, infold and outfold hinges arranged within planes which radiate from and include said axis and the sides which adjacent rows have in common being outfold hinges.

4,227,335

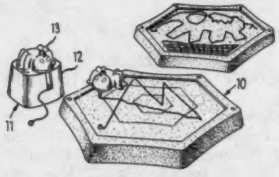
GRAPHIC ART TOY

Wayne A. Kuna, Elmhurst, and Rouben T. Terzian, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 5, 1979, Ser. No. 1,179

Int. Cl.³ A63H *33/00, 13/00*; D05C *5/00, 15/06*

U.S. Cl. 46—1 R **16 Claims**



1. A graphic arts toy, comprising:

a base;

a wall on the base provided with an exposed surface, said wall having a flexible substrate and being provided with a plurality of openings extending from said surface at least partially into said substrate and positioned in spaced apart relationship around said surface to form a variety of graphic patterns;

an elongated flexible string adapted to be pushed into said openings at spaced intervals to form loops entirely within said substrate and thus interconnect selected ones of said openings to form a graphic pattern on said surface; and

means for storing and dispensing said elongated flexible string including a housing shell which is manually movable over the exposed surface of said wall, spool means

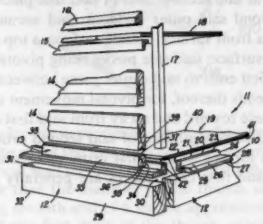
rotatably mounted within the housing for feeding said string and manually actuatable means on the exterior of said housing for engagement by the user to rotate the spool in a direction to store the string on the spool within the housing.

4,227,336

MINIATURE HOUSE CONSTRUCTION

Robert J. Misterka, 702 Sugar Creek Trail, Convers, Ga. 30207

Filed Dec. 11, 1978, Ser. No. 968,355
Int. Cl.³ A63H *33/14*
U.S. Cl. 46—12 **1 Claim**



1. An improvement in the construction of a miniature home comprising ground flooring having a top surface, an underside and outer edges and an exterior side wall section having front, back and bottom surfaces, the improvement comprising:

means for simultaneously supporting said flooring and said exterior side wall section in perpendicular relationship to each other, said supporting means comprising an L-shaped member having a top ledge portion, a bottom ledge portion and a vertical section interconnecting said top and bottom ledge portions with said top ledge portion terminating in said vertical section and said bottom ledge portion laterally extending from the bottom of said vertical section for a distance at least equal to the width of said exterior wall section, whereby said flooring is supported on said underside adjacent said outer edges on said top ledge portion and said exterior wall section is supported along said bottom surface on said bottom ledge portion, the bottommost member of said exterior wall section being a single unit and the remaining portion of said exterior wall section being formed of multiple units of said single unit and wherein said ground flooring is supported on said top ledge portion so that said top surface of said ground flooring is so-planar with the upper surface of said single unit when said exterior wall section is supported on said bottom ledge portion.

4,227,337

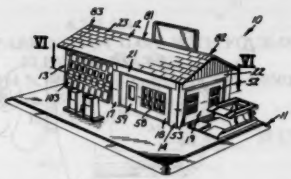
TOY BUILDING UNITS

Dale L. Murray, Hopkins, and Jerry L. Dohse, St. Louis Park, both of Minn., assignors to Tonka Corporation, Spring Park, Minn.

Filed Feb. 9, 1979, Ser. No. 10,795
Int. Cl.² A63H *33/08*
U.S. Cl. 46—12 **12 Claims**

1. A toy building construction comprising:

a base member, a plurality of spaced upstanding support posts mounted on said base member, a plurality of wall panels, each of said panels being fitted between a pair of said support posts, and a roof structure mounted above said support posts and wall panels, said base member including a plurality of pairs of upwardly extending projections, each pair of said projections being adapted to coact with one of said support posts to frictionally secure said support post to said base in a clamp-like manner, said support posts each including wall means defining at least a pair of channels extending the length of said support post, said wall means serving to frictionally engage one of said projections in the end of each of said pair of channels,



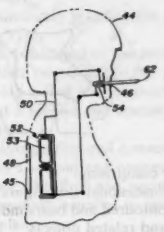
said wall means further serving to entrap one end of one of said wall panels in one of said channels.

4,227,338

THERMOMETER AND DOLL HAVING CAPACITY TO REGISTER TEMPERATURE

Walter D. Colquitt, 18673 Wisconsin, Detroit, Mich. 48221

Filed Aug. 11, 1978, Ser. No. 932,765
Int. Cl.³ A63H *33/26, 3/36, 11/00*; G09B *23/28*
U.S. Cl. 46—45 **11 Claims**



1. A doll and thermometer in combination wherein said doll is provided with an aperture and an electric circuit comprising:

a power source;

at least one resistive heating element; and

means operable to open and close said circuit and wherein said thermometer, when inserted into the doll through said aperture, disposes said resistive heating element in electrical connection with said power source with the heat generated by said resistive heating element being registered on said thermometer.

4,227,339

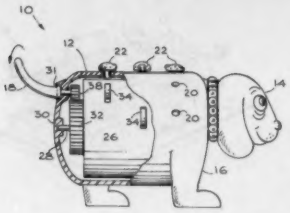
TOY ANIMAL

Walter Moe, Los Angeles, Calif.; Charles M. Diker, New York, N.Y., and Harley Wolf, Studio City, Calif., assignors to Diker Moe Associates, West Los Angeles, Calif.

Filed Feb. 1, 1979, Ser. No. 8,436
Int. Cl.³ A63H *11/00*
U.S. Cl. 46—123 **3 Claims**

1. A toy comprising a generally-cylindrical hollow central portion having a number of apertures from its exterior to its interior, a cylinder mounted to rotate in the interior of the central portion, means for rotating the cylinder, a thing having

a projecting appendage selected to extend through said apertures into the interior of the central portion, and means including a spring mounted to said cylinder for causing said thing to fly off of the exterior of the central portion.



4,227,340
PLAY SET

Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Elonne Dantzer, Redondo Beach, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.

Filed Feb. 12, 1979, Ser. No. 11,445
Int. Cl.³ A63H *3/00*
U.S. Cl. 46—151 **18 Claims**

1. A play set comprising:

(a) a three-dimensional doll figure having a front surface which is contoured and bears indicia to represent original posturing and related objects;

(b) at least one attachment piece for releasibly attaching to said doll figure, said piece having a contoured portion for overlying a portion of the front surface of the doll figure and an attachment means for engaging said doll figure to releasibly attach the piece to the doll figure, said piece being contoured and bearing indicia to represent posturing and related objects different from said original posturing and related objects, said piece being proportioned and arranged to block from view portions of said original posturing and related objects and to present to view different posturing and related objects from those which are blocked, and

(c) wherein said doll figure is self-standing and said piece is also self-standing, said doll figure being supported by said piece when they are attached together and said piece rests on a supporting surface for the play set.

4,227,341
RING TOY

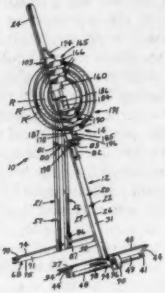
William A. Kaul, Jr., 10009B Spearfish Ave., Ellsworth AFB, S. Dak. 57706

Filed Dec. 5, 1978, Ser. No. 966,617
Int. Cl.³ A63H *33/02*
U.S. Cl. 46—220 **6 Claims**

1. A ring toy, comprising:

a generally T-shaped first member having an elongated generally linear center piece, said center piece having a front generally planar surface a back generally planar surface, opposite generally parallel side surfaces, a first, handle end, a second end spaced from said first end, and a first cross piece perpendicularly connected to said front surface of said center piece at said second end of said center piece and extending transversely beyond said side edges, said first cross piece having a front surface, a back surface, a top surface, a bottom surface and a pair of opposite spaced ends, each of said ends of said first cross piece having notches formed therein;

a generally T-shaped second member having a pair of parallel elongated side pieces spaced the width of said center piece, each of said side pieces having a front surface, a back surface, opposite generally parallel spaced inner and outer side surfaces and first and second spaced ends, and a second cross piece connected transversely to said front surface at said second ends of said side pieces and extending beyond said outer surfaces, said second cross piece having a front surface, a back surface, a top surface, and a bottom surface; said side pieces being pivotally connected at said first ends to said center piece between said first and second ends thereof, for pivotal movement of said second cross piece toward and away from said first cross piece so that said bottom surface of said second cross piece abuts said top surface of said first cross piece and so that said second and first cross pieces are generally coplanar and said side pieces and center piece are generally coplanar when said back surface of said second cross piece is in planar contact with said front surface of said center piece;



a wheel;

a pair of spaced wheel support members connected to and extending from said back surface of said first cross piece to rotatably mount said wheel;

a latch pivotally connected to said back surface of one of said side pieces for pivotal movement across said back surfaces of said center pieces and the other of said side pieces to releasably secure said first member to said second member;

a generally U-shaped member including a pair of arms having first bent ends, and a bottom portion transversely interconnecting said arms, each of said first bent ends being pivotally secured to said outer edge of one of said side pieces;

a guide member secured to said back surface of said center piece and configured to define therewith a slot within which said bottom portion of said U-shaped member slides to limit said pivotal movement of said second member with respect to said first member; and

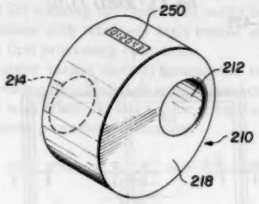
a cylindrical roller rotatably mounted within said bottom edge of said first cross piece.

4,227,342

THUMB TWIDDLING TOY

Horace A. Knowles, 506 G St., SW., Washington, D.C. 20024, assignor to Horace A. Knowles, Washington, D.C.

Filed Jul. 6, 1979, Ser. No. 55,746
Int. Cl.[3] A63H *33/26, 1/32;* A63B *67/00, 59/00*
U.S. Cl. 46—228 **14 Claims**



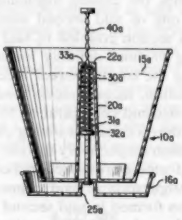
1. A device for use in twiddling the thumbs comprising: first means to rotate about the first digit of a first thumb comprising a first cylindrical wall member defining a first hole of diameter slightly larger than the diameter of the thumb, said first wall member being smooth and of a length approximately equal to the length of the first digit of the thumb. second means to rotate about the first digit of a second thumb comprising a second cylindrical wall member defining a second hold of diameter slightly larger than the diameter of the thumb, said second wall member being smooth and of length approximately equal to the length of the first digit of the thumb; said first circular wall member being spaced from said second circular wall member by an intermediate portion of width no greater than about ⅛ the thickness of the thumb.

4,227,343

HORTICULTURE DEVICE FOR ROTATING PLANTS DUE TO TRANSPIRATION AND EVAPORATION OF MOISTURE

Calvin Espy, 2303 Riverbrook Rd., Decatur, Ga. 30032, and Thomas Goddlv, Atlanta, both of Ga., assignors to Calvin Espy, Decatur, Ga.

Filed May 30, 1979, Ser. No. 43,896
Int. Cl.[3] A47G *7/00*
U.S. Cl. 47—39 **5 Claims**



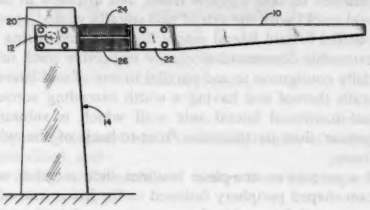
1. A horticulture device for rotating a plant, comprising;
a container means for holding the plant and water for the plant;
means for supporting the container;
motion converting means disposed between the container means and the support means for converting linear motion to rotary motion;
compression spring means disposed between the container means and support means for compression when gravitational force is applied to the container means by adding water to the container means, whereby as the water is lost from the container means the compression spring means moves the container means upward relative to the support means, said motion converting means being connected to rotate the container means as the spring means expands due to loss of water from said container means.

4,227,344

AUTOMATIC PARKING LOT GATE WITH FOUR-WAY FLEX CONNECTOR

David Poppke, 1414 N. 16th St., Bismarck, N. Dak. 58501

Filed Feb. 15, 1979, Ser. No. 12,330
Int. Cl.[2] E01F *13/00*
U.S. Cl. 49—9 **15 Claims**



1. A parking lot gate for selectively blocking a path of a vehicle, the parking lot gate comprising:
an elongated gate arm for blocking the path when in an essentially horizontal position and being pivotable about a pivot axis in an essentially vertical plane to an upraised position out of the path;
arm drive means for selectively pivoting the gate arm about the pivot axis;
a first connection plate connected to the arm drive means;
a second connection plate connected to the gate arm;
a first coil spring having a first end connected to the first connection plate and a second end connected to the second connection plate;
a second coil spring having a first end connected to the first connection plate and a second end connected to the second connection plate, the first and second coil springs being positioned essentially parallel to one another in an essentially vertical plane;
first connecting means for connecting the first ends of the first and second coil springs to the first plate, wherein the first connecting means comprises first inserts which extend into and are welded to the first ends of the first and second coil springs and are connected to first connection plate; and
second connecting means for connecting the second ends of the first and second coil springs to the second plate, and wherein the second connecting means comprise second inserts which extend into and are welded to the second ends of the first and second coil springs and are connected to the second connection plate.

4,227,345

TILT-LOCK SLIDE FOR WINDOW SASH

Robert C. Durham, Jr., 2416 NE. 27 Terrace, Fort Lauderdale, Fla. 33305

Filed Jan. 26, 1979, Ser. No. 6,653
Int. Cl.[2] E05D *13/12*
U.S. Cl. 49—181 **2 Claims**

1. In combination with
a window frame presenting opposite vertical sides which define respective vertically elongated tracks with vertically elongated openings which face toward each other at the inside of the window frame, each of said opposite vertical sides of the window frame having opposite lateral side walls along the respective track which extend laterally outward from the respective vertically elongated opening at the inside of the window frame, and wherein said window frame at each side presents a pair of verti-

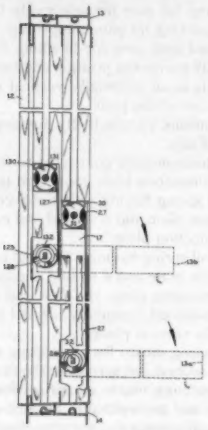
cally elongated lips along the front and back of said vertically elongated opening at the inside of the frame, with the lips of each pair extending toward each other substantially perpendicularly away from said opposite side walls of the respective track in the window frame to confine said slide member and said spring in the respective track, and a transverse side wall at the outside of the frame extending perpendicularly between said opposite lateral side walls;

and a window sash fitting closely and slidably inside said frame;

the improvement which comprises:

a respective flat leaf spring with a spirally wound upper end fastened to said window frame and disposed in each of said tracks with the axis of said spirally wound upper end parallel to said lateral side walls, each said spring being extensible downward along the respective track substantially contiguous to and parallel to one of said lateral side walls thereof and having a width extending across said last-mentioned lateral side wall which is substantially greater than its thickness front-to-back of the window frame;

and a respective one-piece resilient slide member with a cam-shaped periphery fastened to the lower end of each spring and disposed in the respective track in the window



frame, each said slide member being rigidly coupled to the window sash for movement in unison therewith vertically along the window frame and pivotally with respect to the window frame, each said slide member having a minimum diameter extending substantially horizontally when the window sash is vertical and being readily slidable vertically along the respective window frame track when its minimum diameter is substantially horizontal, and each slide member having a portion of larger diameter which is frictionally wedged between said opposite lateral side walls of the respective window frame track when the slide is turned by tilting the window sash substantially from its vertical position, whereby to lock the window sash against vertical movement in the window frame when so tilted;

said slide member having an axis substantially parallel to said lateral side walls and having means forming a substantially C-shaped opening therein extending about said axis which makes said slide member resiliently yieldable from both lateral side walls when wedged between said opposite lateral side walls to assist in said locking action;

and the lower end of said spring being partially wrapped around said periphery of said slide member when said slide member is turned.

4,227,346

MODULAR CASE SECTION AND FRAME SECTION FOR LIFTING AND/OR SLIDING WINDOWS OR DOORS

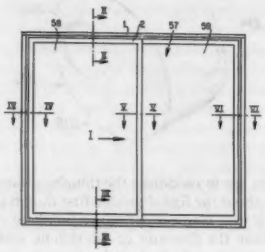
Hans Kubik, Bodenwöhr, Fed. Rep. of Germany, assignor to Golde GmbH, Geretsried, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,202

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 7725150[U]

Int. Cl.[2] E05D *13/02*

U.S. Cl. 49—425 **16 Claims**



1. In a lifting and/or sliding closure assembly such as windows and/or doors of the type which include case and frame sections formed of modular elongate first and second hollow elements, the first elements arrangeable end to end within a building opening to define a casement construction and said second elements arrangeable end to end to define a sash construction receivable within said casement construction for defining said closure, a running carriage mechanism and a closing mechanism, and means operable to couple the sash construction within the casement construction, the invention comprising each of said sections having plural enclosed chambers therein, said first and second elements each having circumferential walls defining a generally rectangular cross-sectional configuration, a plurality of elongate guide sections, first flange means formed on said guide sections and first recess means formed along the length of one of said circumferential walls of said first element receiving said first flange means coupling said guide sections to said first element, the running carriage mechanism being received within a selected one of said second elements, the closing mechanism being received within a selected one of said second elements, an elongate hollow connection section coupled to said guide section and outwardly opening channel defining means formed on said guide section along the length thereof receiving a portion of said connection section, second recess means formed in said second element of size and configuration to receive a selected one of said connection section, a running carriage mechanism and closing mechanism recpectively therein, said second recess means being of conforming cross-sectional configuration to the cross-sectional configuration of said connection section, and plural groove means formed in said second elongate elements along the length thereof and plural sealing members seated within said grooves and extending outward therefrom.

4,227,347

TWO MOTOR DRIVE FOR A WAFER PROCESSING MACHINE

Johann Tam, Saratoga, Calif., assignor to Silicon Valley Group, Inc., Sunnyvale, Calif.

Filed Sep. 14, 1978, Ser. No. 942,268

Int. Cl.[3] B24B *47/00*

U.S. Cl. 51—235 **1 Claim**

1. A drive mechanism for a wafer processing machine of the kind in which a silicon wafer is held on the top of a rotatable chuck and is rotated at a relatively low and precisely controlled speed during a first processing operation, such as an edge contouring or upper surface cleaning operation, and in

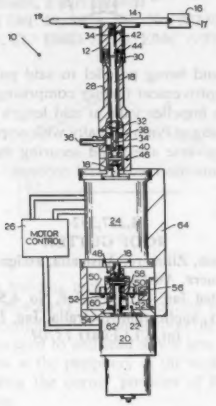
which the wafer is then rotated at high speed during a subsequent operation, such as rinsing and drying, said drive mechanism comprising,

a chuck constructed to hold a wafer on top of the chuck with the periphery of the wafer extending outwardly from the chuck,

a drive shaft connected to rotate the chuck,

low-speed gear motor means operatively connected with the drive shaft for rotating the chuck and wafer in one direction of rotation with relatively high torque at low speed during the first processing operation,

high-speed motor means directly connected to the drive shaft for rotating the chuck and wafer in said one direction of rotation with relatively low torque at high speed during the subsequent processing operation,



the operative connection between the low-speed motor means and the drive shaft including overrunning clutch means for permitting the high-speed motor means to overrun the low-speed motor means and to rotate the chuck and wafer in said one direction of rotation at high speed during the subsequent processing operation and

biasing means for energizing the high-speed motor toward rotation in a direction opposed to said one direction and for applying a counter torque to the drive shaft in a direction counter to the direction of rotation of the drive shaft by the low-speed motor means to insure against any slack or rebounding through the overrunning clutch means which could result in the wafer rotating, momentarily or continuously, at a speed greater than the low-speed motor and thereby producing loss of speed control or chattering during the first processing operation.

4,227,348

METHOD OF SLICING A WAFER

Robert R. Demers, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,458

Int. Cl.³ B24B 1/00

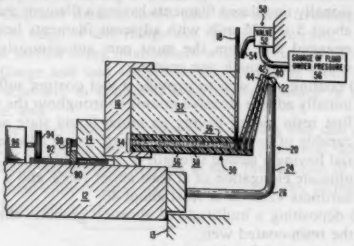
U.S. Cl. 51—283 R **3 Claims**

1. A method of slicing wafers from an ingot which comprises a boule of the material to be sliced into wafers and a binding material for retaining the wafers as part of said ingot after they have been sliced, wherein said method comprises slicing a plurality of wafers from said boule prior to severing any of said plurality of wafers from said ingot, said method comprising:

(a) slicing a wafer from said boule with the blade of a wafer saw, without severing said wafer from said ingot;

(b) applying a force to said wafer to lean said wafer a sufficient distance away from said blade to prevent said blade from contacting said wafer during the return stroke of said blade, all without severing said wafer from said ingot;

(c) returning said blade to its initial position clear of said ingot while said wafer is leaned away from said blade;



(d) repeating steps a, b and c until said plurality of wafers has been sliced; and

(e) severing said plurality of wafers from said ingot after completing step (d).

4,227,349

PRECISION BLOCKING OF LENS BLANK

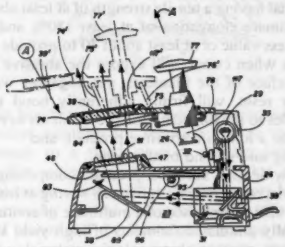
Bela J. Bicskei, 7 Hememway Rd., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 893,078, Apr. 3, 1978. This application Oct. 31, 1978, Ser. No. 956,244

The portion of the term of this patent subsequent to Feb. 6, 1996, has been disclaimed.

Int. Cl.³ B24B 1/00

U.S. Cl. 51—284 E **5 Claims**



1. The method of blocking a lens blank at a prescribed optical position comprising the steps of:

(a) adjusting a lens blank in an instrument until said lens blank satisfies a prescribed optical condition; and

(b) pivoting a pivotable member of said instrument to said lens blank without disturbing the position of said lens blank; and

(c) using a plunger mechanism of said pivotable member to bring a releasable block bearing a double-faced adhesive strip into contact with the lens blank to adhesively secure the block to the blank.

4,227,350

LOW-DENSITY ABRASIVE PRODUCT AND METHOD OF MAKING THE SAME

Robert C. Fitzer, Birchwood Village, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 2, 1977, Ser. No. 847,922

Int. Cl.³ B24D 11/02

U.S. Cl. 51—295 **19 Claims**

1. A method for making low-density abrasive product, comprising:

(1) extruding high yield strength thermoplastic organic

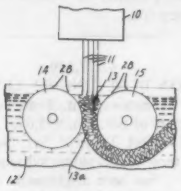
filament-forming material to provide at least one row of equally spaced molten filaments which are permitted to fall through an air space and into a quench bath where they coil and undulate to form a uniform cross-section, open, porous, lofty continuous filament web having at least one layer comprised of a multitude of three-dimensionally undulated filaments having a filament diameter of about 5 to 125 mils with adjacent filaments being inter-engaged and from the most part autogenously bonded where they touch one another;

(2) coating said web to provide a wet coating sufficient to initially adhere abrasive granules throughout the web by a first resin binder having an initial liquid state and being capable of being cured to a strong, tough adherent material having a tensile strength of at least about 3000 psi, an ultimate elongation of at least about 180% and a Shore D hardness value of at least about 40;

(3) depositing a multitude of abrasive granules throughout the resin-coated web;

(4) curing said first binder resin coating;

(5) coating the abrasive granule coated web with a coating of a second binder resin having an initial liquid state and



being capable of being cured to a strong, tough, adherent material having a tensile strength of at least about 3000 psi, an ultimate elongation of at least 180% and a Shore D hardness value of at least about 40 to provide the coating, which when cured, will expose the abrasive granules on the surface of the filaments, yet, together with said first binder resin, will firmly adherently bond the abrasive granules to the filaments and the filaments to each other to provide a long-life abrasive product; and

(6) curing said second binder resin.

9. A low-density abrasive product comprising a uniform cross-section, open, porous, lofty web having at least one layer, each layer being comprised of a multitude of continuous three-dimensionally undulated fialments of high yield strength filament-forming organic thermoplastic material with adjacent filaments being inter-engaged and autogenously bonded where they touch one another, said filaments having a diameter of about 5 to 125 mils, and a multitude of abrasive granules uniformly dispersed throughout and adherently bonded to the filaments of said web by a tough adherent binder having a tensile strength of at least 3000 psi, an ultimate elongation of at least about 180% and a Shore D hardness of at least about 40.

4,227,351

CENTRIFUGAL WHEEL ASSEMBLY FOR SPRAYING APPARATUS

Wolfgang Jahn, Hagen, Fed. Rep. of Germany, assignor to Firma Maschinen und Werkzeugfabrik Kabel Vogel & Schemmann, Hagen-Kabel, Fed. Rep. of Germany

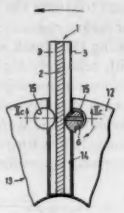
Filed Apr. 10, 1979, Ser. No. 28,673

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1978, 2816602

Int. Cl.[3] **B24C** *3/02*

U.S. Cl. 51—434 **11 Claims**

1. In a centrifugal wheel assembly including a disc-type guide wheel having a rotary axis; a plurality of impeller vanes oriented radially with respect to the guide wheel; each impeller vane having a longitudinal axis and oppositely located particle propelling surfaces being of identical shape and being arranged symmetrically with respect to the longitudinal axis; and securing means for releasably fastening each impeller vane to the guide wheel; the improvement wherein each said impeller vane is of symmetrical structure with respect to a transverse axis oriented perpendicularly to said longitudinal axis and contained in a central plane passing through the respective



impeller vane and being parallel to said particle propelling surfaces; the improvement further comprising means defining recesses in each impeller vane at mid length thereof; said recesses being arranged symmetrically with respect to said longitudinal and transverse axes; said securing means comprising clamping elements received in said recesses.

4,227,352

ROOF GUTTER

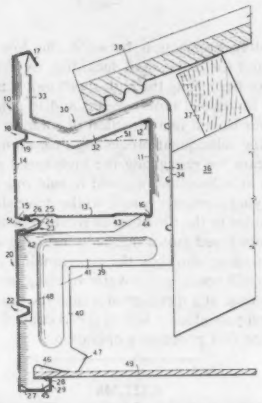
Dennis M. Hallam, Zillmere, Australia, assignor to E. Sachs & Co. Ltd., Zillmere, Australia

Filed Jan. 18, 1979, Ser. No. 4,524

Claims priority, application Australia, Jan. 19, 1978, PD3080

Int. Cl.[3] **E04D** *13/04*

U.S. Cl. 52—11 **2 Claims**



1. A roof gutter assembly comprising:

(a) a series of mounting brackets adapted to be secured to a roof assembly, each of said brackets being integrally formed and including a back member engaging said roof assembly, an upper arm extending forwardly from said back member, and a vertically extending front upright member, said back member forming an acute angle with said upper arm and being formed with a locking notch at its lower end, and

(b) a channel-shaped gutter having substantially vertical front and back flanges, and a bottom wall interconnecting said flanges, said front flange including a hooked support flange at its upper end which extend rearwardly over said front upright member, a longitudinal groove formed in said front flange approximately intermediate the height thereof, said groove having rearwardly convergent top

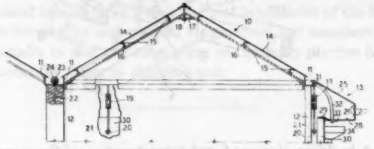
and bottom faces, said bottom face being below the top of the back flange of said gutter and having overflow ports formed therein, a locking bead formed at the juncture of said back flange and said bottom wall and engaging said locking notch of said back member of said bracket when said gutter is installed, said back flange of said gutter having a top return flange which is tightly positioned in the acute angle juncture of said back member and upper arm of said mounting bracket whereby said gutter is supported against movement on said bracket at at least three locations.

4,227,353

BUILDING CONSTRUCTION

Ronald H. Lewis, Southport, Australia, assignor to Jess Lewis, Southport, Australia, a part interest

Filed Oct. 19, 1978, Ser. No. 952,927
Int. Cl.[2] E04D *13/06*; E04C *1/39*
U.S. Cl. 52—15 **6 Claims**



1. A roof for a building including:

a plurality of adjacently disposed roofing units each comprising a pyramid-shaped main section the lower edges of which are secured to and lead down into an assembly of channel ducts at the periphery of the roof,

means supporting the corner portions of the assembly of channel ducts,

means connecting in sealed manner the adjacent channel ducts of successive roofing units,

fascia units engaged with the channel ducts at the periphery of the roof, each fascia unit including a top secured over the outer flange of a channel duct and substantially co-planar with an inclined surface of the pyramid-shaped main section, an upright outer part, and a substantially horizontal bottom part forming a soffit, and

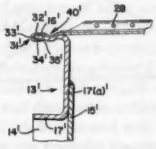
rainwater outlets from said channel ducts connected by conduits to discharge outlets on the soffit.

4,227,354

ROOF TO WALL CONNECTION FOR A RAILWAY CAR

George S. McNally, South Holland, Ill., and Richard C. Snyder, Michigan City, Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jan. 5, 1979, Ser. No. 1,081
Int. Cl.[2] B61D *17/12*
U.S. Cl. 52—56 **8 Claims**



1. A connection for attaching a roof to a wall of a railway car, said connection comprising:

means having an outwardly extending flange at the upper edge of said wall,

said flange having a first upper surface, a free edge and a second lower surface,

a roof sheet having an edge portion,

said edge portion having first and second sections and a fold nose disposed therebetween, said fold nose overlapping said free edge of said flange and spaced therefrom,

said first section being in abutment with said first surface of said flange and said second section extending from said fold nose and in abutment with second surface of said flange, and

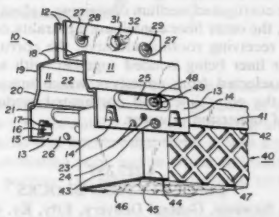
means for interlocking said roof sheet portion and said outwardly extending flange including complemental downwardly offset portions formed in said first section of said roof sheet edge portion and said flange thereby forming a weather-tight joint.

4,227,355

SUPPORT SYSTEM FOR SOUND ABSORBING PANELS

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Mar. 30, 1978, Ser. No. 891,864
Int. Cl.[2] E04B *7/16*
U.S. Cl. 52—64 **25 Claims**



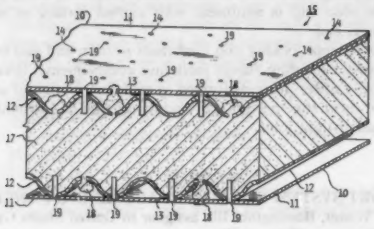
1. A hanger bracket comprising two opposing substantially identical bracket members for securing one or more sound absorbing panels to a fixed support member wherein the bracket members comprising the hanger bracket are of one piece integral construction, said bracket members have upper and lower generally vertical plates residing in offset substantially parallel planes and the lower plate having at least one punched-out tab portion extending generally inward then upward from the lower plate and said members have a horizontal portion extending outwardly a distance less than one-half the width of the panel frame member at generally right angles to the upper plate from a lower edge thereof and said horizontal portion terminating at an edge opposite the upper plate in an intermediate vertical plate depending downwardly at generally right angles to the horizontal portion and said intermediate vertical portion having a lower skewed portion skewed obliquely outwardly therefrom and said skewed portion terminating at an edge opposite the intermediate vertical portion in a lip portion extending outwardly in a generally horizontal plane and said lip is connected at an edge opposite the said skewed portion to the lower vertical plate portion, said hanger bracket adapted to secure sound absorbing panels having a top frame member with a depending lip portion wherein said bracket members are opposingly connected to each other, and adapted to be secured to a support member by connector means at said upper vertical plates, whereby, said punched-out tab portions are adapted to engage the depending lip of a panel frame to thereby support the panel, and the lip portions of each bracket member positioned to contact opposing outer corner portions of a panel top frame and the vertical plate portions contact outer surfaces of the depending lip portions of a panel frame member, and said connected bracket members form a hollow generally rectangular opening therebetween.

4,227,356

COMPOSITE FOAM ROOF INSULATION

Eric P. Stern, Dollard Des Ormeaux; George J. Venta, Pointe Claire; Riad Mia, Pont Rouge, and Solomon M. Vines, Montreal, all of Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 23, 1978, Ser. No. 889,793
Int. Cl.[2] E04C *2/26*
U.S. Cl. 52—309.4 **8 Claims**



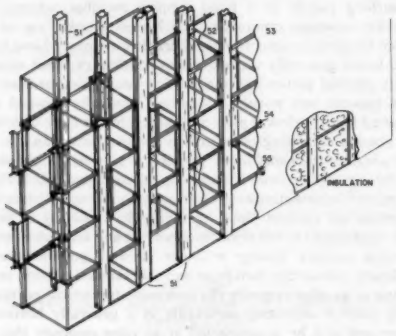
1. A heat-insulating sandwich-like foam composite roofing panel comprising a core of foamed resin compound in adhering contact with, sandwiched between and penetrating into corrugated material comprising an outer liner and corrugated medium, the corrugated medium containing a plurality of pre-perforations, the outer liner containing a plurality of post-perforations for receiving roofing adhesive, the corrugated medium and outer liner being bonded together with a wet strength adhesive selected from adhesives which maintain the bond between the outer liner and corrugated medium over long periods of immersion in water.

4,227,357

CONSTRUCTION BLOCKS

Bobby G. Newsom, General Delivery, Etty, Ky. 41523

Filed Feb. 16, 1978, Ser. No. 12,949
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—344 **23 Claims**



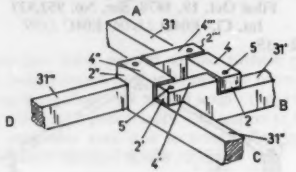
1. A construction block, comprising:
a top frame;
a bottom frame shaped identical to said top frame and forming the bottom perimeter of said construction blocks;
a plurality of support members secured between said top frame and said bottom frame, said support members dimensioned to cause said top frame and said bottom frame to lie in superposed and parallel orientation with respect to each other;
said top and bottom frames configured to form a rectangle with a furring strip receiving recess formed in the mid-section of one side to create the top and bottom perimeters of said construction block, said top and bottom perimeters including first and second sections encompassing equal areas joined by an area of lesser width created by said recess; and
said construction block fabricated from formed and welded metal rods.

4,227,358

BUILDING ELEMENT FOR CONSTRUCTION OF INTERLOCKING GRIDS

Daniel Gat, Haifa, Israel, assignor to Technion Research & Development Foundation, Haifa, Israel

Filed Nov. 28, 1978, Ser. No. 964,434
Claims priority, application Israel, Aug. 21, 1978, 55404
Int. Cl.[2] E04H *12/00*
U.S. Cl. 52—648 **16 Claims**



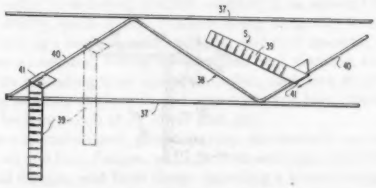
1. A building element for the construction of floor and roof grids comprising: a beam, girder or truss having two ends and which is provided in the upper portion of at least one of said ends with a longitudinally protruding first projection of a vertical dimension less than the vertical dimension of the beam, girder or truss, the element being further provided with a first recessed portion disposed in its upper surface, of a width not less than the width of said projection and of a depth not more than half the vertical dimension of the beam, truss or girder at said ends, said first recess beginning a distance from said end of the element which is greater than the protruding length of the said first projection but which is small relative to the entire longitudinal length of the element, wherein said beam, girder or truss is symmetrical and is provided with a second protruding projection and a second recessed portion beginning at the other of said ends symmetrically disposed with respect to said first projection and said first recessed portion at said at least one end, and wherein said recessed portions beginning at each said end consist of a single central recess extending over the entire central portion of the element at equal depth.

4,227,359

ADJUSTABLE SINGLE UNIT MASONRY REINFORCEMENT

Robert W. Schlenker, Baltimore, Md., assignor to National Wire Products, Baltimore, Md.

Filed Nov. 21, 1978, Ser. No. 962,620
Int. Cl.[2] E04B *2/30*
U.S. Cl. 52—713 **13 Claims**



1. An adjustable prefabricated masonry reinforcing unit comprising a block mesh reinforcement body portion of the truss type including parallel longitudinal rod members rigidly

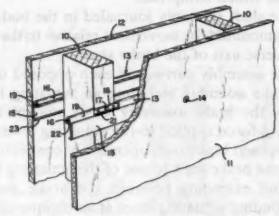
interconnected in a substantially common plane by cross-connecting rod members, said parallel longitudinal rod members defining the side boundaries of the width of said body portion, said body portion being of a width adapted for placement wholly within a bed joint of one wythe in a wall structure, and a plurality of elongated corrugated strip ties pivotally and slidably connected through closed loops in permanently assembled relationship with at least one of said rod members of said body portion with said pivotal and slidable closed loop connections positioned on said at least one of said rod members for placement bodily within the bed joint of said one wythe, said ties being independently adjustable lengthwise of the body portion and also being independently adjustable laterally of the body portion to vary their distances of projection outwardly of one of said longitudinal rod members defining the longitudinal side boundaries of the body portion, said ties following their adjustments on the body portion being engageable in bed joints of a second wythe in a wall structure, and said ties being independently shiftable through said closed loop connections to protected shipping positions on the body portion where the ties are located substantially within the side boundaries of the body portion formed by said parallel longitudinal rod members and substantially in said common plane of the body portion forming a compact, integral shipping unit.

4,227,360

RESILIENT FURRING MEMBER

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed May 5, 1977, Ser. No. 794,185
Int. Cl.[2] E04C *3/30*; E04B *5/52*; E06B *3/54*
U.S. Cl. 52—720 **1 Claim**



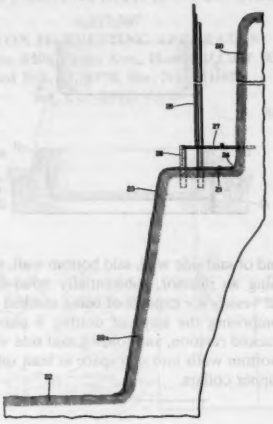
1. A sheet metal resilient runner for the attachment of gypsum wallboard to substantially vertical stud members, said runner comprising a base attaching flange disposed in a first plane, a turned over curved section integral with the base flange and merging into a flexible web having a width substantially equal to said base flange and laterally offset from the base flange thereby being disposed in a second plane in generally parallel spaced relation to said base flange, wherein said flexible web is provided with cut-out portions at longitudinally spaced intervals to expose a portion of said base attaching flange and said base attaching flange is provided with longitudinally spaced groups of attachment holes coinciding with said intervals of the cut-out portions in said flexible web, a first flange integral with said flexible web extending laterally at an obtuse angle from a continuous longitudinal edge of said web, a support portion coextensive and integral with the opposite edge of said first flange and disposed in a third plane in laterally offset generally parallel relation to said web, and a stop flange extending laterally from the opposite longitudinal edge of the support portion, said stop flange being disposed at an obtuse angle and inclined in a direction opposite to the inclination of said first flange so that the stop flange and said first flange incline toward each other.

4,227,361

METHOD OF CONSTRUCTING A SWIMMING POOL

Clarence J. Miller, Canton, Ohio, assignor to Bradley Enterprises, Inc., Canton, Ohio

Filed Mar. 16, 1979, Ser. No. 20,950
Int. Cl.[2] E04H *3/16*
U.S. Cl. 52—742 **7 Claims**



1. In a method of constructing a swimming pool of the type in which an excavation is formed in the ground, in which the excavation has a bottom and a horizontal footing area which supports a vertical wall member that forms at least a portion of a wall of the swimming pool, and in which the wall member has a bottom portion; the improvement which includes the steps of:

(a) forming a concrete footing on the horizontal footing area with the bottom portion of the vertical wall member embedded in the concrete footing;

(b) attaching removable groove-forming means generally horizontally to the vertical wall member at a desired distance above the concrete footing;

(c) pouring additional concrete over at least a portion of the concrete footing and upwardly against a portion of the vertical wall member to a position in which a portion of the groove-forming means is embedded in the additional concrete;

(d) removing the groove-forming means from the vertical wall member to expose a groove formed in the additional poured concrete; and

(e) filling the groove with waterproof caulking material to seal a seam formed between the additional concrete and the vertical wall member.

4,227,362

METHOD OF FORMING A MULTIPLE PACK OF VESSELS

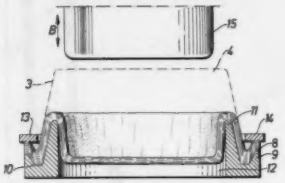
Hans I. Wallsten, Chemin de la Lisiere 6, Lausanne, Switzerland (CH-1018)

Filed Dec. 29, 1978, Ser. No. 974,442
Claims priority, application Sweden, Jan. 19, 1978, 7800642
Int. Cl.[3] B28B *11/08*; B65B *35/50*
U.S. Cl. 53—447 **5 Claims**

1. A method of forming a multiple pack from a plurality of pre-formed, substantially bowl-shaped, disposable vessels each having a bottom wall and adjoining side wall made of thin, flexible material and a stiff, upper, peripheral collar joined to the upper end of said side wall, said bottom wall, side wall, and collar defining an interior, substantially bowl-shaped space, wherein said vessels are capable of being stacked one inside of another, comprising the steps of folding said side wall of each

of a plurality of said vessels individually to move the bottom wall into said space at least substantially to the upper collar and nesting a plurality of the folded vessels into stacked relation.

2. A method of forming a multiple pack from a plurality of pre-formed, substantially bowl-shaped, disposable vessels each having a bottom wall and adjoining side wall made of thin, flexible material and a stiff, upper, peripheral collar joined to



the upper end of said side wall, said bottom wall, side wall, and collar defining an interior, substantially bowl-shaped space, wherein said vessels are capable of being stacked one inside of another, comprising the steps of nesting a plurality of said vessels in stacked relation, and folding said side walls to move the nested bottom walls into said space at least substantially to the nested upper collars.

4,227,363

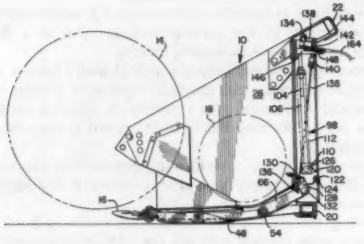
FLOATING CUTTERBAR HEADER AND HEIGHT CONTROL

Dathan R. Kerber, Bettendorf, Iowa; Orlin W. Johnson, East Moline, Ill.; Robert D. Week, Bloomington, Minn.; Richard E. Benson, East Moline, Ill.; John L. VandeWiele, and James R. Lucas, both of Moline, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 1, 1978, Ser. No. 939,001

Int. Cl.[3] A01D *67/00*

U.S. Cl. 56—10.2 **3 Claims**



1. A harvesting header for a mobile harvesting machine comprising:

a header frame adapted for mounting on the harvesting machine for powered movement vertically relative to the machine;

a cutterbar floatably mounted on the header frame for ground-induced movement relative thereto as ground level varies during harvesting;

means for applying a counterbalancing force on the cutterbar to floatably support the cutterbar;

and means for raising and lowering said header frame in response to sensing the vertical position of said cutterbar, said means including:

(a) a member connected to the cutterbar for movement therewith and having an end disposed proximate to the rear of the header frame.

(b) a rockshaft mounted on the header frame,

(c) a link connected between said end of said member and said rockshaft for translating vertical movement of the cutterbar into rotational movement of the rockshaft,

(d) a hydraulic system for raising and lowering the header frame,

(e) and a cable connected between said rockshaft and said system for actuating the system in response to rotation of the rockshaft to raise or lower the header frame, said hydraulic system including means for varying the rate of header movement in response to variable rate of ground-induced movement of the cutterbar, whereby the header will lift progressively faster as the cutterbar moves progressively higher over a rise in the ground.

4,227,364

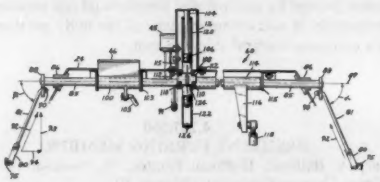
SELF-COMPENSATING BRAKE SYSTEM FOR A MOWING MACHINE

David J. Scherbring, Edina, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Feb. 7, 1978, Ser. No. 875,785

Int. Cl.[3] A01D *69/10*

U.S. Cl. 56—10.8 **7 Claims**



1. A self-compensating brake system for a drive vehicle having a body which rotatably carries a least two opposed drive wheels, which comprises:

(a) a brake shaft rotatably journaled in the body and being slidably mounted for movement relative to the body along a transverse axis of the brake shaft;

(b) a brake assembly carried on each opposed drive wheel, each brake assembly including an actuating lever which operates the brake assembly in an amount equal to an activating force applied to the actuating lever; and

(c) two opposed brake rods operatively connecting opposite ends of the brake shaft to one of the actuating levers, each brake rod extending between the brake shaft and the corresponding actuating lever at an oblique angle relative to the transverse axis such that rotation of the brake shaft applies a force along the brake rod having at least a first component along the transverse axis, whereby the brake shaft will be moved transversely until the first components of force along the transverse axis provided by the opposed brake rods are substantially equal to achieve equal braking of the drive wheels.

4,227,365

MOWING MACHINE

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed May 18, 1977, Ser. No. 798,136

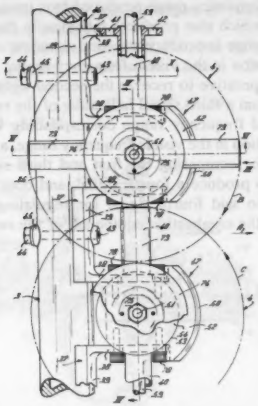
Claims priority, application Netherlands, May 20, 1976, 7605371

Int. Cl.[3] A01D *55/18*

U.S. Cl. 56—13.6 **35 Claims**

1. A mowing machine comprising a frame which includes a beam and plurality of cutting rotors mounted along the length of said beam of said frame, driving means engaging said rotors, said rotors including upwardly extending drive shafts and being rotatable about corresponding axes defined by said upwardly extending drive shafts and said driving means engaging said rotors, said beam extending transverse to the rear of said

axes with respect to the normal direction of travel, each of said rotors being releaseably fastened as a unit to said beam and



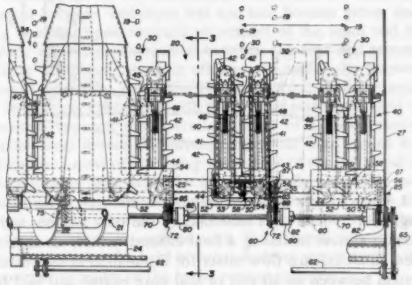
each said unit comprising an upper rotatable hub and lower stationary body, a respective said drive shaft of said rotor being supported by said body.

4,227,366

CORN HEADER DRIVE SYSTEM

Richard A. Pucher, Leola, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Aug. 6, 1979, Ser. No. 64,327
Int. Cl.[3] A01D *45/00, 69/00*
U.S. Cl. 56—14.2 **15 Claims**



1. A corn harvesting header attachable to a mobile crop treating unit comprising:

a main frame having a transverse substantially horizontal beam;

a plurality of forwardly extending row units supported by said beam, each respective said row unit having gathering means for harvesting and delivering the crop material rearwardly thereof, each said respective row unit being operable to harvest a row of corn;

a gear housing corresponding to each said respective row unit, said gear housing including gears for drivingly operating each respective said gathering means;

at least one transverse power input shaft supported by said frame externally of said gear housings for delivering rotational power thereto from a prime mover;

a clutch means corresponding to each said respective said gear housing, mounted on said at least one power input shaft and operable for terminating the transmission of power from said at least one power input shaft to each respective corresponding gear housing if the associated gathering means becomes overloaded, each respective said clutch means being operable without affecting the transmission of power to any other gear housing; and

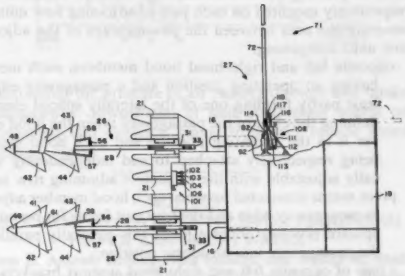
a power transfer means interconnecting each respective said clutch means and the associated gear housing for transferring the rotational power delivered by said at least one power input shaft to said associated gear housing.

4,227,367

COTTON HARVESTING APPARATUS

John L. Fagundes, 8576 Fargo Ave., Hanford, Calif. 93230

Filed Feb. 12, 1979, Ser. No. 11,485
Int. Cl.[3] A01D *46/08*
U.S. Cl. 56—36 **10 Claims**



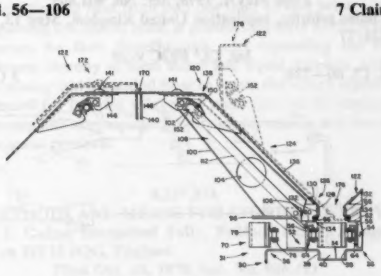
1. In a cotton harvesting apparatus for harvesting cotton from cotton plants planted in spaced generally parallel rows, a wheeled framework having ground engaging means for permitting movement over the ground, a cotton picking mechanism carried by the wheeled framework and adapted to engage the cotton plants to remove the cotton therefrom, and at least one boom mechanism carried by the framework and adapted to engage the cotton plants before they are engaged by the cotton picker mechanism to shake the plants to cause leaf and steam fragments to fall therefrom and means for moving said boom mechanism between the plant engaging position and an out-of-the-way position.

4,227,368

GATHERER SHEET ARRANGEMENT FOR A ROW CROP HARVESTING HEADER

Michael W. Mossman, Rock Island, and Glen W. Rohweder, Moline, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Jul. 18, 1979, Ser. No. 58,690
Int. Cl.[3] A01D *45/02*
U.S. Cl. 56—106 **7 Claims**



1. In a row crop harvesting header for a harvesting machine adapted to advance over a field of row planted crops and having a transversely elongated main frame, a plurality of transversely spaced row units extending forwardly from the

main frame, each row unit including a row unit frame, means mounting the row unit frame on the main frame for independent vertical floating adjustment of the forward end of the row unit, a pair of laterally spaced elements mounted on the row unit frame and defining a generally fore-and-aft passageway adapted to receive a row of crop material as the machine advances, conveyor means mounted on the row unit frame and having opposite rearwardly moving inner runs on opposite sides of the passageway and operative to engage the crop material and move it rearwardly along the passageway and cutting means mounted on the row unit frame generally below the forward end of the conveyor means for severing the crop material relatively close to the ground as the crop material moves rearwardly along the passageway, an improved hood arrangement overlying the space between the adjacent row units to prevent the loss of material between adjacent units, respectively mounted on each pair of adjoining row units and covering the area between the passageways of the adjoining row units comprising:

opposite left and right-hand hood members, each member having an operating position and a passageway edge at least partly forming one of the laterally spaced elements defining the edge of the passageway when the hood member is in the operating position and each hood member being respectively attached to and independently vertically adjustable with the respective adjoining row units;

pivot means connected between each hood member adjacent its passageway edge and the row unit frame for permitting upward pivoting about a pivot axis generally parallel to the passageway into an access position;

a pair of opposite left and right-hand support brackets carried by each row unit frame, each support bracket including a first latching member;

a second latching member carried by each hood member, each second latching member being disposed to engage a first latching member upon downward pivoting of the hood member from the access position and, responsive to downward pressure on the hood member after engagement, to latch the latching members one to the other so that the hood member is secured in the operating position and, responsive to upward pressure on the hood after latching, to release one from another permitting upward pivoting of the hood element into the access position; and

a forwardly converging divider member respectively mounted on each pair of adjoining row units and extending forwardly from adjacent hood elements, the forward end of each divider member moving between the adjacent rows as the machine advances.

4,227,369

CONTROL SYSTEMS FOR APPARATUS

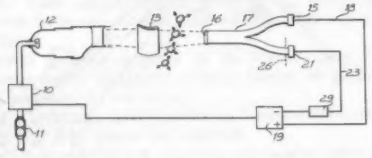
Peter J. Williams, Bristol, England, assignor to Rolls-Royce Limited, Bristol, England

Filed May 1, 1978, Ser. No. 901,805

Claims priority, application United Kingdom, May 13, 1977, 20323/77

Int. Cl.³ F02C 9/28

U.S. Cl. 60—734 **3 Claims**



1. A fuel control system for a gas turbine engine comprising: first and second radiation detectors positioned to monitor radiation emanating from combustion equipment of the engine, the first detector being responsive to radiation in the infra-red frequency range to produce a first signal representative of the radiation in the infra-red frequency range, the second detector being responsive to radiation in the visible frequency range produced by a transient radiation event which also produces radiation in the infra-red frequency range to produce a second signal representative of the radiation in the visible frequency range, a function generator operative to receive the second signal and derive therefrom a third signal indicative of the radiation in the infra-red frequency range corresponding to the detected radiation in the visible frequency range, a comparator means for comparing the first and third signals and operative to produce a fourth signal, and control means responsive to said fourth signal for regulating the fuel supplied to the combustion equipment of the engine.

4,227,370

BY-PASS GAS TURBINE ENGINES

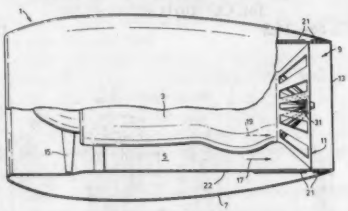
Timothy J. Kirker, Alvaston, England, assignor to Rolls-Royce Limited, London, England

Filed Oct. 24, 1978, Ser. No. 954,921

Claims priority, application United Kingdom, Nov. 4, 1977, 45976/77

Int. Cl.³ F02K 3/04

U.S. Cl. 60—262 **2 Claims**



1. For a by-pass gas turbine engine of the type having a core engine, a by-pass duct surrounding the core engine, and an exhaust system including a final exhaust nozzle, an improvement in an exhaust flow mixer for installation in said exhaust system between an aft end of said core engine and said final exhaust nozzle, said mixer comprising first and second sets of discrete, elongated, substantially planar flow surfaces arranged in an annular array, said mixer being installed in said exhaust system with said planar flow surfaces extending generally downstream of said aft end of said core engine and attached thereto at their upstream ends, said planar flow surfaces of said first set having downstream extending edges along a major portion of their lengths unattached to downstream extending edges of said planar flow surfaces of said second set, each of said flow surfaces being circumferentially spaced apart from an adjacent one of said flow surfaces in the same set, said first set of flow surfaces defining a first truncated conoid converging in a downstream direction so as to extend through a region of the core engine exhaust flow whereby some of the by-pass exhaust flow is deflected into the region of said core engine exhaust flow, and said second set of flow surfaces defining a second truncated conoid surrounding said first conoid and diverging in the downstream direction so as to extend through a region of by-pass exhaust flow whereby some of said core engine exhaust flow is deflected into the region of said by-pass exhaust flow.

4,227,371

AUTOMOTIVE BRAKE BOOSTER DEVICE

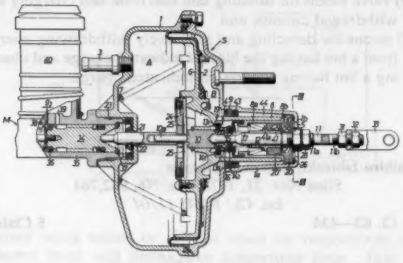
Hiroo Takeuchi, Ueda, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Mar. 15, 1978, Ser. No. 887,414

Claims priority, application Japan, Dec. 24, 1977, 52/174854[U]

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547 R **6 Claims**



1. An automotive brake booster device of the type including a booster shell, a booster piston slidably accommodated in the booster shell, a first working chamber defined in the booster shell by the booster piston on the front side thereof and continuously held in communication with a source of vacuum supply, a biasing means for urging the booster piston in a retracting direction, a second working chamber defined in the booster shell by the booster piston on the rear side thereof, an input rod connected with a brake pedal and arranged opposite the booster piston for movement toward and away from the latter, control valve means for selectively placing the second working chamber in communication with the first working chamber and the external atmosphere, said control valve means being arranged between said input rod and said booster piston and being operable upon forward movement of the input rod to produce a pressure differential between the first and second working chambers which is effective to cause the booster piston to follow the movement of the input rod, and an output rod operatively connected with the booster piston and held in a position opposite the operating piston of a brake master cylinder, said device comprising adjustable stop means for limiting the extent of retracting movement of the input rod in such a manner that, with the input rod fully retracted, said control valve means is held in a neutral position to keep the second working chamber out of communication with the first working chamber as well as with the external atmosphere while the output rod is held in direct abutting engagement with the operating piston of the brake master cylinder.

4,227,372

MOTOR VEHICLE EQUIPPED WITH TURBOCHARGER

Kunihiko Kakimoto, Yokohama, and Masaru Kodaira, Kodaira, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 22, 1978, Ser. No. 935,853

Claims priority, application Japan, Aug. 24, 1977, 52-101946

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—602 **15 Claims**

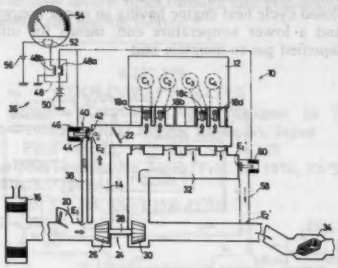
1. A motor vehicle having an engine body formed with combustion chambers, comprising:

means defining an intake passageway through which the combustion chambers are communicable with atmospheric air to supply the combusion chambers with air;

a turbocharger having a compressor wheel rotatably disposed in said intake passageway to pressurize air passing through said intake passageway, said turbocharger being driven by the pressure of exhaust gases discharged from the combustion chambers;

vehicle speed sensing means for sensing a vehicle cruising speed of a predetermined level or higher to produce an electric signal; and

means, responsive to said vehicle speed sensing means, for



decreasing the pressure of air passing through said intake passageway downstream of said compressor wheel on receiving said electrical signal from said vehicle speed sensing means.

4,227,373

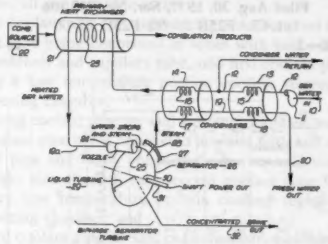
WASTE HEAT RECOVERY CYCLE FOR PRODUCING POWER AND FRESH WATER

William E. Amend, Rolling Hills Estates, and Walter R. Studhalter, Woodland Hills, both of Calif., assignors to Biphase Energy Systems, Inc., Santa Monica, Calif.

Filed Nov. 27, 1978, Ser. No. 963,786

Int. Cl.³ F01K *23/10*

U.S. Cl. 60—618 **44 Claims**



1. In a method for producing steam from aqueous brine, employing hot fluid, nozzle means, and rotary separator means, the steps that include

(a) transferring heat from said hot fluid to said brine,

(b) passing the heated brine in pressurized state to the nozzle means for flow therethrough, and expanding the flow therein thereby to form steam and liquid droplets, and

(c) causing said expanded flow to rotate the rotary separator means for forming a layer of said brine on the separator means and accompanied by steam separation and for subsequent removal.

4,227,374

METHODS AND MEANS FOR STORING ENERGY

Alan J. Oxley, Sheepstead Folly, Frilford Heath, Abingdon, Oxon OX13 6QG, England

Filed Oct. 20, 1978, Ser. No. 956,411

Int. Cl.³ F01K *25/08*

U.S. Cl. 60—651 **10 Claims**

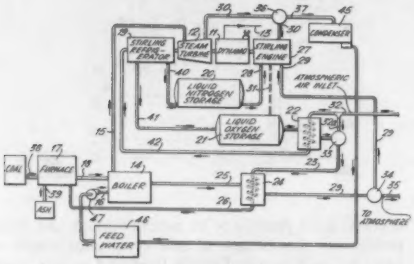
1. A plant including means for storing energy and subsequently releasing said energy when required, said means comprising:

refrigeration means, responsive to said energy, for refriger-

ating gas and liquefying said gas at substantially below atmospheric temperature;

storage means for storing said liquefied gas at substantially below atmospheric temperature;

a closed cycle heat engine having an upper temperature end and a lower temperature end; means for utilising said liquefied gas to maintain said



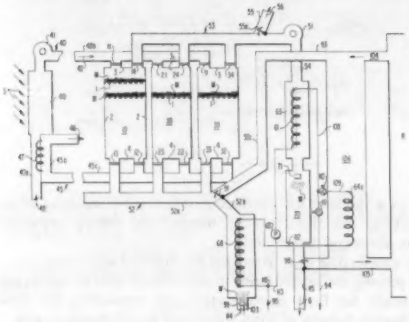
lower temperature end at substantially below atmospheric temperature and means for maintaining said upper temperature end at not significantly below atmospheric temperature, thereby driving said heat engine and yielding mechanical energy, said engine including a working fluid independent of said liquefied gas.

4,227,375

DESICCANT THERMAL ENERGY STORAGE SYSTEM FOR COMPACT HEATING AND COOLING

Leo Tompkins, 127 Wacaster St., Jackson, Miss. 39209, and Harold Strain, 345 Woodstone Rd., F-5, Clinton, Miss. 39056

Filed Aug. 30, 1977, Ser. No. 829,106
Int. Cl.[2] F25B *27/00*; F25D *23/00*
U.S. Cl. 62—2 **10 Claims**



1. A thermal energy storage system comprising:

(a) at least three enclosed isolatable storage bins;

(b) desiccant material within said at least three storage bins to provide for the prolonged storage of energy in the form of dryness of the desiccant material, said energy being derived from an unreliable or discontinuous source of heat;

(c) a charging circuit for varying the moisture content of said desiccant material by circulating a heated, dry gas through at least one of said bins and over said desiccant material to cause said desiccant material to give up moisture to said charging circuit gas and to render said desiccant material to a dry, charged state wherein said charging circuit includes a supply duct which is open at one end to the atmosphere and includes a heat reclaim/solar collector therein for raising the temperature of the ambient air entering said charging circuit supply duct, and said charging circuit includes a return duct which discharges to the atmosphere;

(d) a withdrawal circuit connected to said at least three bins including means for selectively varying the moisture content of the desiccant material by circulating a moisture laden gas through said charged desiccant material to cause said gas to reject moisture to the desiccant material and to thereby raise the gas temperature within said withdrawal circuit;

(e) valve means for isolating said bins from said charging and withdrawal circuits; and

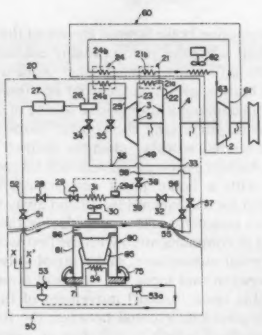
(f) means for detecting and selectively withdrawing energy from a bin having the highest indicated charge and charging a bin having the lowest indicated charge.

4,227,376

COOLING SYSTEM

Yoshihiro Ishizaki, Kamakura, Japan

Filed Nov. 21, 1978, Ser. No. 962,761
Int. Cl.[3] F25D *11/04*
U.S. Cl. 62—434 **5 Claims**



1. A system for cooling portions of a transportation vehicle, said system comprising:

(a) compressor means for providing compressed refrigerant;

(b) an air conditioning circuit connected to said compressor means for receiving compressed refrigerant therefrom and returning refrigerant thereto, said air conditioning circuit including condensing means and first evaporating means;

(c) a refrigeration circuit connected to said compressor means for receiving compressed refrigerant from said compressor means and returning refrigerant thereto, said refrigeration circuit including second evaporating means and a cooling plate disposed to receive refrigerant from said second evaporating means; and

(d) a storage container detachably affixed to said vehicle, said container including a heat conducting surface maintained in a heat exchange relationship with said cooling plate when said storage container is affixed to said vehicle, said container further including means for accumulating the low temperature conducted to said heat conducting surface from said cooling plate.

4,227,377

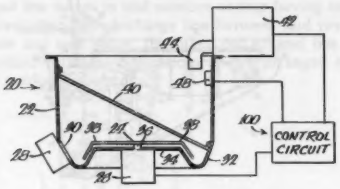
CONTROL SYSTEM FOR ICE DISPENSER AND METHOD

Benjamin D. Miller, Chicago, Ill., assignor to Remcor Products Company, Franklin Park, Ill.

Filed Jul. 26, 1978, Ser. No. 928,242
Int. Cl.[3] F25C *1/00*
U.S. Cl. 62—66 **9 Claims**

1. A method of operating an ice dispenser of the type having a hopper for storage of a mass of small particles of ice, compris-

ing the steps of introducing ice into an upper end of the hopper; sensing when ice reaches a selected level in the hopper; commencing timing of a predetermined time interval in response to the sensed level of ice reaching the selected level; agitating the mass of ice in the hopper after ice reaches said selected level and during said timing step while continuing to introduce ice into the hopper; and, after agitation and at the expiration of the predetermined interval, continuing or interrupting introduction of ice into the hopper in accordance with the sensed level



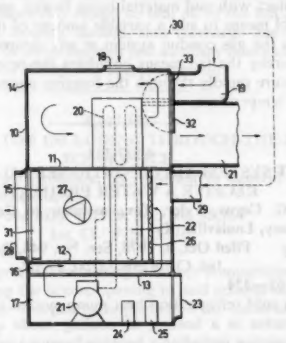
thereof being below or at least equal to, respectively, said selected level said timing step comprising timing first and second discrete periods of time which together equal the predetermined time interval, said agitating step comprising agitating the ice for the first period of time after it reaches said selected level; said continuing or interrupting step comprising sensing whether the ice is at said selected level at the end of the second period time following the first period, and continuing or interrupting said manufacturing and introducing steps in accordance therewith.

4,227,378

METHOD AND DEVICE FOR IMPROVING THE EFFICIENCY OF A HEAT GENERATOR

Sten Thoren, c/o Stén Thorens Elektriska, 870 15 Utansjö, Sweden

Filed May 30, 1978, Ser. No. 910,893
Claims priority, application Sweden, Jun. 2, 1977, 77 064665
Int. Cl.³ F25D *21/12, 23/02, 29/00;* F25B *47/00*
U.S. Cl. 62—82 **11 Claims**



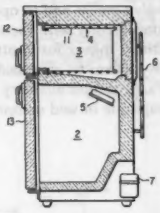
1. In the method of heat generation in a heat pump in which a heat-transfer fluid is circulated between an evaporator section and a condensor section and in which the heat-transfer fluid in the evaporator section is heated by means of an initial indirect heat exchange with a primary fluid medium circulating through said evaporator section, said heat-transfer fluid being evaporated and circulated to the condensor section in which a second indirect heat exchange transfers the heat from the heat-transfer fluid to a secondary fluid medium passing through the condensor section, the improvement for increasing the efficiency of the heat pump comprising the steps of intensively heating at least a portion of the evaporator section by means of circulating said primary fluid medium through said portion of said evaporator section by diverting at least a portion of the primary fluid medium downstream of the evaporator section to flow several times through said evaporator section to intensify the heating thereof.

4,227,379

COOLING APPARATUS

Toshiyuki Oonishi, Takatsuki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 23, 1979, Ser. No. 14,228
Claims priority, application Japan, Feb. 23, 1978, 53/20197; Feb. 28, 1978, 53/24820[U]
Int. Cl.³ F25B *41/00*
U.S. Cl. 62—198 **10 Claims**



1. A cooling apparatus comprising:
a freezing chamber;
a cold chamber;
a compressor having an intake, a condenser, and a capillary tube, all connected in series
a first coolant pipe for said freezing chamber, said first coolant pipe being connected in series with said compressor, condenser and capillary tube, said first coolant pipe forming a low temperature portion cooling region for said freezing chamber;
a second coolant pipe for said freezing chamber, said second coolant pipe being connected in series with said first coolant pipe and being connected adjacent said compressor intake side thereof, said second coolant pipe forming a very low temperature portion cooling region for said freezing chamber; and
a third coolant pipe for said cold chamber, said third coolant pipe being connected between, and in series with, said first and second coolant pipes,
whereby said very low temperature portion is cooled to a lower temperature by said second coolant pipe than said low temperature region is cooled by said first coolant pipe.

4,227,380

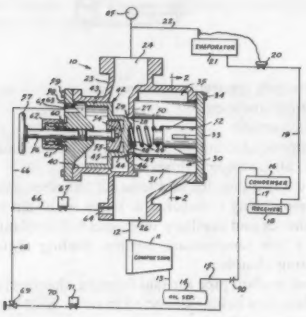
SINGLE CASING, MULTIPLE DUTY VALVE

F. Michael Laucks, Chambersburg, and Rudolph Stegmann, Wellsville, both of Pa., assignors to Frick Company, Waynesboro, Pa.

Continuation of Ser. No. 859,635, Dec. 12, 1977, abandoned. This application Nov. 9, 1979, Ser. No. 92,901
Int. Cl.³ F25B *41/04;* F16K *31/00*
U.S. Cl. 62—217 **4 Claims**

1. A flow control valve system for use in the suction line to a compressor of a vapor refrigeration system having a compressor discharge line to a condenser and an evaporator, comprising a valve housing having inlet and outlet passages, a first wall means within said housing intermediate said inlet and outlet passages, said first wall means having a first opening defining a valve seat, a second wall means within said housing, a substantially cup shaped valve member having a base portion

forming a seat engaging portion and outer wall portions slidably received within second wall means of said housing and movable from a first position in engagement with said seat to a second position remote therefrom, spring means in said housing in a position to engage said valve member and urge it toward the second position, said second wall means and the internal portion of said valve member forming an expansion chamber, said valve housing having a second opening communicating with said expansion chamber and a third opening communicating with said outlet passage, a first pipe means connecting said second and third openings, first auxiliary valve means for selectively opening and closing said first pipe means, a second pipe means connecting said compressor discharge line with said second opening, a second auxiliary valve means for selectively opening and closing said second pipe means, control means responsive to the operation of said compressor for controlling said first and second auxiliary valve means to close said first auxiliary valve means and to open said second auxiliary valve means concurrently with the stopping of compressor operation, and timer means for controlling said first and second auxiliary valve means to open said first auxiliary valve means and to close said second auxiliary valve means after a predetermined startup time of said compressor, whereby during normal running operation of said compressor, said first auxiliary valve means is open and said second auxiliary valve means is closed, thereby connecting the compressor suction line to said expansion chamber and maintaining said chamber under suction pressure, said spring being operative to urge said valve member off of said seat into fully retracted position to permit free passage of refrigerant vapor through said valve housing, and when said compressor operation is shut down, said first auxiliary valve means is closed and said second auxiliary valve means is open, thereby disconnecting the compressor suction line from the expansion chamber and concurrently connecting the compressor discharge line with the expansion chamber thereby increasing the pressure therewithin to that of the compressor discharge and operative to move said valve member onto said seat against the resistance of said spring, and during start-up of said compressor, said timer means causing said first auxiliary valve means to remain closed and said second auxiliary valve means to remain open for a predetermined start-up time to avoid overloading said compressor at low speed, and thereafter said first auxiliary valve means is opened and said second auxiliary valve means is closed to permit said valve member to open fully and positively and maintain said expansion chamber under suction pressure.

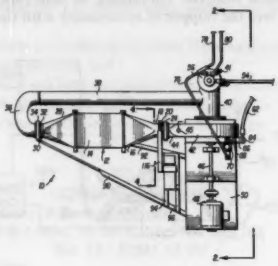


4,227,381

WIND TUNNEL FREEZER

John J. Sullivan, Poynette, and Eugene D. Prine, Madison, both of Wis., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 13, 1979, Ser. No. 20,026
Int. Cl.³ F25B *41/04*
U.S. Cl. 62—223 **14 Claims**



1. An apparatus for cryogenic batch freezing of a large volume of material comprising

a freezing chamber with entry means to permit insertion of the material to be frozen in the chamber;

a gas inlet means on one side of the chamber;

a gas outlet means on the opposite side of the chamber;

gas recycle conduit means positioned outside the freezing chamber connecting the gas outlet means of the chamber with the gas inlet means of the chamber to thereby form a gas conduit system;

fan means positioned in the gas recycle conduit means outside the freezing chamber to circulate gas throughout the apparatus;

container means within said chamber adapted to hold said material to be frozen and being removable from said chamber to withdraw the frozen product, said container means having openings in the sides adjacent the gas inlet and gas outlet means to permit the circulating cold gas to pass through the container means so the gas is in direct contact with said material being frozen; and

control means to add a variable amount of the cooling gas into the gas conduit system at any desired cooling rate whereby the fan means circulates the resulting cold gas mixture rapidly through the freezing chamber to control the temperature.

4,227,382

SPLIT SYSTEM AIR CONDITIONER ADAPTED TO RECEIVE A WATER PREHEATER

Gerard G. Coyne, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 4, 1978, Ser. No. 948,594
Int. Cl.³ F25B *13/00, 27/02*
U.S. Cl. 62—324 **1 Claim**

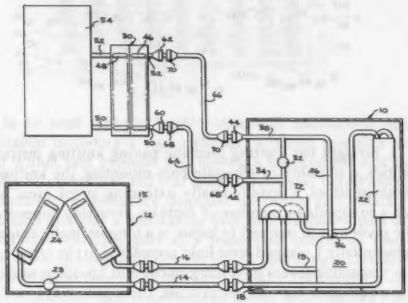
1. In a split refrigeration heat pump system air conditioner for operation in a heating or cooling mode comprising an outdoor section including a housing having a compressor and an outdoor heat exchanger, and an indoor section having an indoor heat exchanger, one end of said indoor heat exchanger being interchangeably connected by a reversing means to said compressor inlet through a suction line or said compressor outlet through a discharge refrigerant line, the other end of said indoor heat exchanger being connected to one end of said outdoor heat exchanger by a second refrigerant line, the other end of said outdoor heat exchanger being interchangeably connected by said reversing means to the outlet of said compressor through said discharge line or said suction line, means adapting said outdoor section for selectively connecting an auxiliary heat exchanger in permanent series flow relationship

with the heat exchanger in said system functioning as the system condenser comprising;

a valve means in said discharge line being arranged intermediate said compressor outlet and said other end of said outdoor heat exchanger;

a first line means in said outdoor section having one end connected to said discharge line between said compressor outlet and said reversing means, the other end of said line being provided with sealed connector means arranged outside said outdoor section;

a second line means in said outdoor section having one end connected to said discharge line between said reversing means and said valve, the other end of said line being provided with sealed connector means arranged outside said outdoor housing;



an auxiliary heat exchanger connected in bypass relationship to said flow interrupting means;

means for placing water in heat exchange relationship with said auxiliary heat exchanger;

connecting means associated with the inlet and outlet of said auxiliary heat exchanger, said connecting means being operable when selectively connected to said first and second line means connectors to establish a series flow between said auxiliary heat exchanger and said heat exchanger functioning as the condenser when said valve means is selectively closed so that all of the hot gaseous refrigerant flowing through said discharge line will always flow in series through said auxiliary heat exchanger, regardless of the system operating mode.

4,227,383

REFRIGERATOR INCLUDING THROUGH-THE-DOOR ICE SERVICE

Julius B. Horvay, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 4, 1979, Ser. No. 35,954

Int. Cl.³ F25C *5/18*

U.S. Cl. 62—344 **8 Claims**

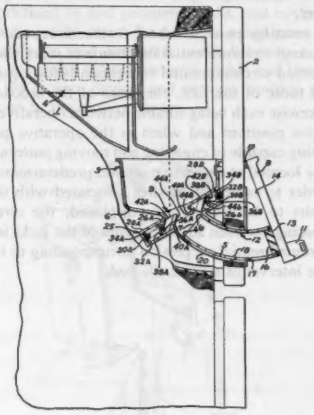
6. In a refrigerator comprising a freezer compartment and a door for closing the access opening to said compartment;

an ice storage receptacle supported on the inner surface of said door;

said door having a passage with an opening area communicating with the interior of the receptacle;

a closure member mounted on the outer surface of said door for opening and closing said passage, said member being pivotally mounted on said door above said passage;

a tubular member having an external end carried on the inner surface of said closure member, said tubular member extending within said passage and having an internal end opening upwardly toward said receptacle, said tubular member having an arcuate shape for clearing the walls of said passage during pivotal movement of said closure member and a length sufficient to extend at least into the opening area when the closure member is closed, said tubular member having a discharge opening in the bottom wall portion thereof intermediate the ends of said member for dispensing ice pieces contained in said tubular member when said closure member is in its open position and said discharge opening being normally closed by the walls of the passage when the closure member is in its closed position;



stop means located in the opening area passage for preventing the passage of ice pieces into the passage when the closure member is opened comprising two gate members biased toward each other and each having a cam surface, said gate members movable to a first position by biasing means obstructing the passage when the closure member is opened and movable to a second position opening the passage by the tubular member exerting force on the cam surfaces when the closure member is closed.

4,227,384

KNITTING-MACHINE PATTERNING SYSTEM

Helmut Irmscher, Karl-Marx-Stadt, Fed. Rep. of Germany, assignor to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Fed. Rep. of Germany

Filed Mar. 31, 1978, Ser. No. 893,325

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 198225

Int. Cl.² D04B *15/70, 15/74*

U.S. Cl. 66—75.1 **10 Claims**

1. In a knitting machine which includes an elongated needle bed and a series of knitting needles disposed in said bed for longitudinal shifting movement, a novel patterning arrangement, the patterning arrangement comprising, in combination,

a bolt carrier structure extending along the length of the needle bed, the bolt carrier structure being provided with pattern-bolt guide bores accommodating pattern bolts guided within said bores for movement in a direction which is transverse to both the direction of elongation of the needles and the direction in which adjoining needles in the needle bed are spaced from each other,

each pattern bolt having a guide passage through which the shank of a respective needle extends,

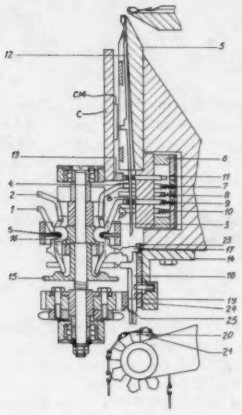
the shank of each individual needle extending through the guide passage of one and only one of the pattern bolts,

the pattern bolts of different needles being located at different heights, measured in the direction of needle elongation;

a cam carriage mounted for travel along the length of the needle bed, the cam carriage being provided with a rotating pattern wheel, the rotating pattern wheel accommodating a first circumferential succession of jacks each

tiltable between operative and inoperative positions, each such jack when in the operative position being capable of engaging and moving pattern bolts which are located at first predetermined heights in order to cause the needles associated with those pattern bolts to be transversely displaced, the circumferential spacing between adjoining ones of the jacks in the first circumferential succession corresponding to the interneedle interval of said needle bed,

the rotating pattern wheel furthermore accomodating a second circumferential succession of jacks, the jacks of the second circumferential succession being equal in number to those of the first, the jacks of the second succession likewise each being tiltable between operative and inoperative positions and when in the operative position each being capable of engaging and moving pattern bolts which are located at respective second predetermined heights in order to cause the needles associated with those pattern bolts to be transversely displaced, the circumferential spacing between adjoining ones of the jacks in the second circumferential succession corresponding to the interneedle interval of said needle bed,



the jacks of the first and second successions each having a bolt-engaging portion, the bolt-engaging portions of corresponding jacks in the two successions being located one directly above the other,

the jacks of the first and second successions each having an activating portion, the activating portions of corresponding jacks in the two successions being located spaced from each other in the direction circumferentially of the pattern wheel,

the pattern wheel accordingly being provided with two jacks per interneedle interval,

the cam carriage furthermore being provided with cam means upstream of the pattern wheel, the cam means being operative for causing those needles which have not been transversely displaced by their pattern bolts to perform predetermined knitting motions;

and jacquard patterning means operative for acting upon the activating portions of the jacks and causing different ones of the jacks of the first and second circumferential successions to assume operative and inoperative positions previous to the performance of an operating stroke by the cam carriage.

4,227,385

STRAIGHT BAR KNITTING MACHINES

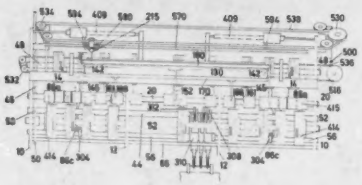
Leonard B. Whittaker, Desford; William Clayton, Leicester; Eric W. Marriott, Shepshed, and Barry C. Strong, Syston, all of England, assignors to William Cotton Limited, Leicestershire, England

Filed Jan. 15, 1979, Ser. No. 3,731

Claims priority, application United Kingdom, Jan. 17, 1978, 1735/78

Int. Cl.[2] **D04B** *11/00, 21/00*

U.S. Cl. 66—82 R **12 Claims**



1. Straight bar knitting machine having knitting instrumentalities, a plurality of elongate bars mounting the knitting instrumentalities, a longitudinally extending pivot area, levers for a predominant number of motions pivotably supported in the pivot area at one end to locate in a longitudinally extending substantially L-shaped zone links connected to the other end of the respective levers governing in-out and up-down motion of the respective bars to reciprocate them side-ways, a fabric formation zone defined by the area in which the respective bars reciprocate, said fabric formation zone, links, levers and pivot areas defining an approximately quadrangular configuration when seen from the side and the pivot area and the fabric formation zone being arranged diagonally opposite in the quadrangular configuration.

4,227,386

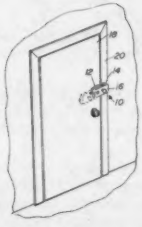
LOCK

Mattie Crockett, 406 E. Baltimore, Flint, Mich. 48505

Filed Jun. 8, 1978, Ser. No. 913,660

Int. Cl.[2] **E05B** *63/02, 63/12, 63/14;* **E05C** *1/00*

U.S. Cl. 70—118 **6 Claims**



1. A dead-bolt lock, comprising:

(a) a sliding bar of a first magnetic polarity,

(b) a jamb mounted keeper of a second magnetic polarity,

(c) means for moving the sliding bar into and out of the keeper,

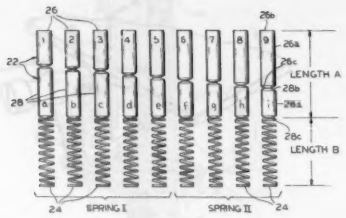
(d) locking means for locking the moving means, and

(e) a cover translatable to enshroud the sliding bar and the keeper.

4,227,387
AXIAL SPLIT-PIN TUMBLER-TYPE LOCK MECHANISM

Robert L. Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Co., Chicago, Ill.

Filed Dec. 11, 1978, Ser. No. 968,438
Int. Cl.[2] E05B 27/08
U.S. Cl. 70—363 11 Claims



1. In an axial split-pin tumbler-type lock mechanism, said mechanism including a lock cylinder, a barrel assembly secured within said cylinder and having a longitudinal axis extending between front and rear ends thereof, said barrel assembly including a forwardly disposed operating part rotatable about said axis and a rearwardly disposed stationary part adjoining the operating part at a transverse interfacial plane, means forming longitudinal bores in said operating and stationary parts, respectively, and disposed radially outwardly of said axis therearound, said bore-forming means in respective parts being relatively movable into and out of longitudinal alignment of their bores upon rotation of said operating part, tumblers each including a forwardly disposed driver element carried in one of said operating part bores and a separate rearwardly disposed follower element carried in one of said stationary part bores with the elements adjoining each other when in aligned bores, said tumblers each being reciprocally movable in the axial direction in aligned bores between respective positions wherein the joint between said elements thereof is disposed on opposite sides of said interfacial plane, said operating and stationary parts being secured against rotation relative to each other when at least one of said tumbler elements bridges said interfacial plane and being rotatable relative to each other when said tumbler joints coincide with said interfacial plane, and spring means yieldingly urging said tumblers in aligned bores forwardly to positions wherein said interfacial plane is bridged by a plurality of said follower elements, said driver elements having front ends engageable with a key, whereby rearward movement of the key moves said tumblers in aligned bores rearwardly to positions wherein said tumbler joints coincide with said interfacial plane, the improvement for obtaining increased pick-resistance which comprises providing said tumblers in substantially equal overall lengths, said tumblers including at least two tumblers having driver elements differing in length, and providing said spring means in at least two different spring rates respectively to act upon said tumblers having elements differing in length, one of said spring means which has a relatively high spring rate acting upon a tumbler having a relatively short driver element, and another of said spring means which has a relatively low spring rate acting upon a tumbler having a relatively long driver element.

4,227,388
SECURITY COVERING BOX

Gus Nigrelli, and Bruce Baron, both of 1036 E. 99 St., Brooklyn, N.Y. 11236

Filed Feb. 12, 1979, Ser. No. 11,180
Int. Cl.[2] E05B 17/18
U.S. Cl. 70—427 11 Claims

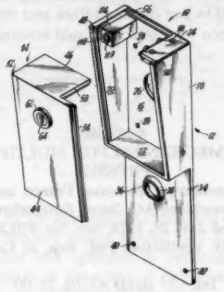
1. A protective box for providing a secure covering for a closure device disposed on a support surface, such as a lock, bolt, and the like, said protective box comprising:

a housing having a rear wall and perimeter walls forwardly extending from said rear wall;

an opening in said rear wall for providing access to the closure device to be protected;

means for fastening said housing onto the support surface;

cover means for closing said housing, said cover means including a cover member covering a front portion of said housing defined by said perimeter walls, said cover member including slide means for permitting said cover member to slide on said perimeter walls between a closed position providing an enclosed area within said housing to protect the closure device, and an open position permitting access to the closure device;



lock means coupled between said cover member and said housing for securely retaining said cover member in said closed position;

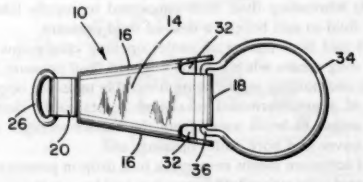
said lock means including a lock disposed on said cover means, a latch coupled to said lock and operated thereby between a locked position and an unlocked position, and latching means disposed on said housing for engaging said latch in said locked position to prevent sliding of said cover member to said open position; and

said latching means including a roller assembly comprising a bracket fastened to said housing, a laterally displaceable roller supported in said bracket, and biasing means for biasing said roller in a lateral direction toward said latch, said latch having upper and lower edges, said lower edge including a cam surface for displacing said roller and said upper edge including a substantially flat edge for engaging against said roller.

4,227,389
KEY HOLDER

Alfred Kartinian, 65 New Rd., Apt. 31, Rumford, R.I. 02916

Filed Apr. 30, 1979, Ser. No. 34,939
Int. Cl.[3] A47G 29/10
U.S. Cl. 70—456 R 9 Claims



1. A key holder comprising a housing having a bottom wall, side and end walls, and a top wall, said top wall comprising a

resilient tongue normally in abutting relation to one of said end walls but adapted to be depressed to a second position wherein an opening is provided between said tongue and said one end wall, said one end wall being positioned between said side walls in spaced relation thereto so as to define slots on opposite sides of said one end wall, and a ring member comprising a first portion having a lateral dimension greater than the distance between said side walls, and a generally rectangular shaped second portion being dimensioned so as to extend through said slots beneath said one end wall, said ring member being readily releasable from said housing by depressing said tongue and removing said rectangular portion through the aforesaid opening provided thereby, said rectangular portion having a slit extending therethrough for permitting keys to be attached and detached, said slit being covered by said one end wall when said ring member is attached to said housing whereby keys can only be attached to and detached from said ring member after the latter has been separated from said housing.

4,227,390

TRANSFER MECHANISM FOR MULTIPLE PUNCH PRESSES

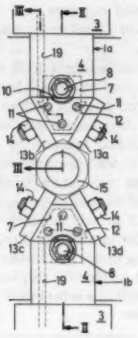
Raymond Schoenenberger, Rosenau, France, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland

Filed Jun. 29, 1978, Ser. No. 920,324

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730490

Int. Cl.³ B21D *43/10, 55/00*

U.S. Cl. 721—4 **10 Claims**



1. A transfer mechanism for a multiple punch press, said mechanism comprising:

(a) two cooperating pairs of conveyor tong means,

(b) holding means for connecting each pair of tong means to a movably mounted carrier member,

(c) each said carrier member including a bore effective to direct a lubricating fluid therethrough,

(d) lubricating fluid lines connected to supply lubricating fluid to said bore at a desired fluid pressure,

(e) said bore having an outlet opening contiguous to said tong means while maintaining said fluid pressure,

(f) said holding means being breakable upon the occurrence of a predetermined maximum resistance to cause tong means to break away from the carrier member and uncover said bore outlet opening, and

(g) actuation means responsive to a drop in pressure within said lubricating fluid lines when said bore outlet opening is uncovered,

(h) said actuation means being effective to stop the press when said drop in pressure occurs.

4,227,391

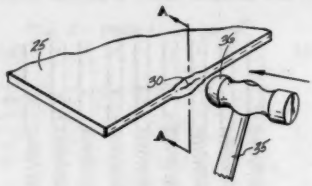
PROCESS FOR MAKING TUBE IN SHEET HEAT EXCHANGERS

Kenneth Belangee, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Filed Jan. 29, 1979, Ser. No. 7,556

Int. Cl.³ B23P *15/26*

U.S. Cl. 72—54 **4 Claims**



1. A process for forming an opening in a composite metal panel comprising at least two sheets of metal having a bond therebetween which can be broken by inflation, said opening extending between said sheets and inwardly of said panel from an edge thereof, said composite metal panel being free of stop weld material sandwiched between said sheets and being adapted for forming a heat exchanger therefrom having a desired pattern of inflated tubular passageways therein, said process comprising:

providing a hammering member having a blunt surface;

hammering with said blunt surface said edge of said panel at a position wherein said opening is to be formed for delineating a bond interface between said sheets of said composite metal panel, said hammering being adapted to upset said metal at said position of said edge of said panel so that said bond interface is delineated by a crack formed between said sheets;

providing a tool having a sharp end adapted to be positioned at said crack formed between said sheets; and

forming said opening at said edge of said panel by inserting said sharp end of said tool into said crack.

4,227,392

SPRING WINDING MACHINE

Reijiro Itaya, Tokyo, Japan, assignor to Itaya Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1978, Ser. No. 946,517

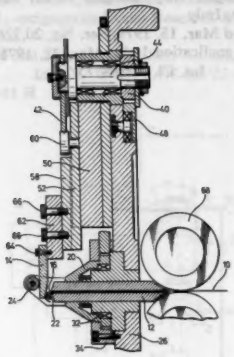
Claims priority, application Japan, Oct. 5, 1977, 52-119605; Oct. 5, 1977, 52-119606

Int. Cl.² B21S *35/02*

U.S. Cl. 72—137 **6 Claims**

1. A coil winding machine comprising a wire guide member having a wire feed channel therein, and a support member turnably arranged in relation to the wire guide member and provided with a turnable core bar member of semi-circular shape and at least one tool member movable toward and away from the core bar member, characterized in that the edge of the turnable core bar member is engaged with an open end of the wire feed channel with a round surface confronting the tool

member, and the tool member is turnable with the support member, so that the core bar member in its longitudinal direc-



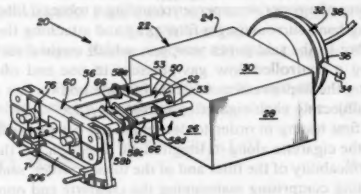
tion is always directed normal to the direction of movement of the tool.

4,227,393

METHOD AND APPARATUS FOR PUNCHING OPENINGS IN TUBES

William G. McElhaney, Jacksonville, Tex., assignor to Anvil Corporation, Jacksonville, Tex.

Filed Jan. 3, 1979, Ser. No. 688
Int. Cl.³ B21D *31/02*
U.S. Cl. 72—327 **13 Claims**



1. An apparatus for punching an opening through tubing comprising:

a stationary mandrel having a guide aperture through the wall thereof and being insertable within the tubing,

a moving actuator having an inclined ramp on one end thereof and receivable within the stationary mandrel,

a punch having an inclined end for engagement on the inclined ramp of said actuator and an opposite end for engagement through the guide aperture in the wall of said stationary mandrel,

interlocking structure on the inclined end of said punch and the inclined ramp of the moving actuator for slidable engagement of the punch on the actuator, such that said punch moves up the inclined ramp of said moving actuator as said actuator is advanced into said stationary mandrel and said punch moves down the inclined ramp of said moving actuator as it is withdrawn from said stationary mandrel, and

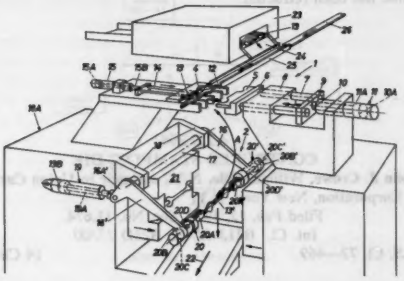
power means for moving said moving actuator into said stationary mandrel whereby said punch is caused to move upwardly on the inclined ramp of said moving actuator and forced radially outward through the guide aperture of said stationary mandrel to punch an opening through the side wall of the tubing and for withdrawing said actuator out of said stationary mandrel to move said punch down the inclined ramp and radially inwardly within the tubing.

4,227,394

PROCESS FOR THE AUTOMATIC MANUFACTURE OF DROP FORGING

Othmar Heimel, Behamberg, Austria, assignor to "Wefoba" Werkzeug-und Formenbau Gesellschaft mbH & Co., KG, Steyr, Austria

Filed Aug. 8, 1978, Ser. No. 931,920
Claims priority, application Austria, Sep. 26, 1977, 6850/77
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—356 **9 Claims**



1. Apparatus for the automatic manufacture of drop forgings comprising prebending means having two cooperating jaws facing each other and operable to prebend a slit off and stamped workpiece, at least one of the jaws being movable towards the other in a horizontal direction;

support means positioned below one of said two cooperating jaws for supporting a workpiece, said support means including a grate having a plurality of horizontally spaced apart members for supporting the workpiece;

transfer means for transferring the prebent workpiece, said transfer means including a pair of pivoted transfer arms having grippers on ends of the arms for gripping and releasably holding ends of the prebent workpiece, the transfer arms being pivotable so that the grippers engage both ends of the supported prebent workpiece, the gripped workpiece being rotated by said transfer arms from a horizontally oriented position to a vertically oriented position; and

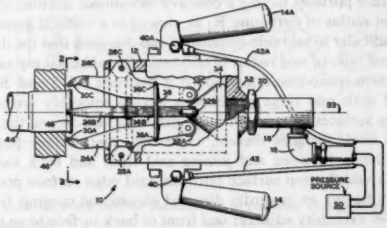
a power hammer for forging a transferred and gripped prebent workpiece and having horizontally movable dies for forging the prebent workpiece to a finished product.

4,227,395

TUBE CRIMPING DEVICE

Louis Plavsity, Barberton, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 26, 1979, Ser. No. 24,236
Int. Cl.³ B21D *41/04*
U.S. Cl. 72—402 **6 Claims**



1. An apparatus for crimping the ends of tubes preparatory of their removal from tube support structures, the apparatus

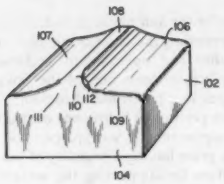
comprising a housing, the housing having a central symmetrical axis, a plurality of members pivotally mounted within the housing and equidistantly disposed about the axis, each member having a crimping end extending beyond the housing, roller means attached to the non-crimping end of each member, a movable cone positioned within the housing and in communication with the rollers, means for extending and retracting the cone, and means for separating the crimping ends from one another so as to position the crimping ends at an angle away from the axis of symmetry of the housing when the cone has been retracted.

4,227,396

CONTOURED STAMPING DIE

John J. Crowe, Williamsville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,674
Int. Cl.³ B21J *13/02*; B21D *37/00*
U.S. Cl. 72—469 **14 Claims**



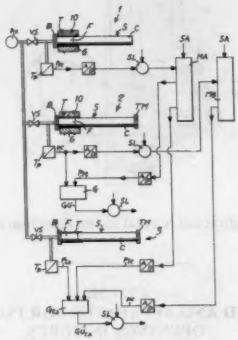
1. A contoured metal die suitable for stamping heat exchange channel element wall members from thin sheet metal, of block-like form having vertically extending side surfaces and vertically extending front and back surfaces, with each of said side surfaces being parallel to the other side surface and perpendicular to said front and back surfaces, whereby said die has a rectangular cross-section in plan view over its entire vertical extent, with a top surface comprising ridge projections extending elongately across said top surface parallel to said side surfaces of said die with flat top surface portions at the extremities of said ridge projections, said flat top surface portions having an aspect ratio (d_2/d_1) of at least 10, wherein d_2 is the longitudinal dimension of the ridge projection flat top surface portion as measured in a horizontal plane containing said flat top surface portions and d_1 is the transverse dimension of the ridge projection flat top surface portion as measured in said horizontal plane containing said flat top surface portions along a direction perpendicular to said side surfaces of said die, with said flat top surface portions being surrounded by top surface portions having a concave elevational contour of constant radius of curvature R_1 as viewed in a vertical plane perpendicular to said side surfaces of said die, such that the dimensional ratio of said radius of curvature R_1 to the flat top surface portion transverse dimension d is between 0.375 and 30,000, and with said ridge projections having smoothly contoured edge surfaces between said top surface of said die and the front and back surfaces thereof, including edge surface portions extending between and joining said front and back surfaces with said flat top surface portions, said edge surface portions each having an inwardly directed elevational contour from a lower extremity adjacent said front or back surface to an upper extremity adjacent said flat top surface portion, as viewed in a vertical plane parallel to said side surfaces of said die and passing through the flat top surface portion.

4,227,397

METHOD FOR TESTING CIGARETTES

Bruno Neri, Bologna, Italy, assignor to Cir S.p.A. Divisione Sasib, Bologna, Italy

Filed Mar. 15, 1979, Ser. No. 20,726
Claims priority, application Italy, Mar. 22, 1978, 12526 A 78
Int. Cl.³ G01N *15/08*
U.S. Cl. 73—38 **3 Claims**



1. In a method for the electropneumatical testing of the composite wrapper of filter cigarettes, said composite wrapper consisting of a paper wrapper surrounding a tobacco filler and a tipping band surrounding a filter plug and attaching the said filter plug to the said paper wrapper, which method includes applying a controlled-flow gas pressure to one end of each cigarette, the improvement wherein said method further comprises subjecting each cigarette, individually, to:

(a) a first testing in order to determine the gas permeability of the cigarette along its longitudinal direction, i.e. the gas permeability of the filter and of the tobacco filler, said first testing comprising maintaining the cigarette end opposed to the end to which the gas pressure is applied open, maintaining the outer surface of the tipping band sealed in a gas tight manner, and deriving a first testing signal representative of the resulting gas pressure applied to the cigarette;

(b) a second testing in order to determine the gas permeability of the paper wrapper which envelopes the tobacco filler, said second testing comprising maintaining the cigarette end opposed to the end to which the gas pressure is applied is closed in a gas tight manner, maintaining the outer surface of the tipping band sealed in a gas tight manner, and deriving a second testing signal representative of the resulting gas pressure applied to the cigarette;

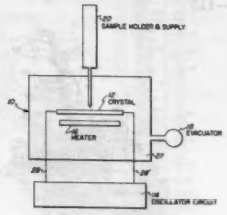
(c) a third testing in order to determine the gas permeability of the whole composite wrapper, said third testing comprising maintaining the cigarette end opposed to the end to which the gas pressure is applied closed in a gas tight manner, and deriving a third testing signal representative of the resulting gas pressure applied to the cigarette, and comparing the second and third testing signal with respective levels of acceptability each presenting a determined value beyond which a cigarette is not acceptable, said value of acceptability being determined for the second testing signal as a function of the value of the first testing signal, and for the third testing signal as a function of the values of the first and second testing signals.

4,227,398

PIEZOELECTRIC GUM MEASUREMENT DEVICE

Mary H. Keirns, Edison, and Robert S. Lunt, III, N. Plainfield, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 14, 1979, Ser. No. 48,501
Int. Cl.[3] G01N *5/04, 33/22*
U.S. Cl. 73—61 R 10 Claims



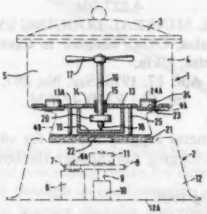
1. An apparatus for measuring high boiling point components and gum present in a liquid stream comprising:
(a) piezoelectric crystal means;
(b) a lipophobic coating applied to said crystal means for controlling sample location;
(c) means for applying a sample to said crystal;
(d) heater means for heating sample on said crystal;
(e) oscillator means associated with said crystal for measuring the resonant frequency thereof;
(f) evacuator means; and
(g) insulated housing means for said crystal and heater.

4,227,399

APPARATUS FOR CONTACTING SAMPLES WITH WATER VAPORS

Kurd Gröninger, Büelstrasse 556, CH-5626 Lengnau, Switzerland

Filed Dec. 15, 1978, Ser. No. 969,651
Claims priority, application Switzerland, Dec. 27, 1977, 16039/77
Int. Cl.[3] G01N *5/02*
U.S. Cl. 73—76 25 Claims



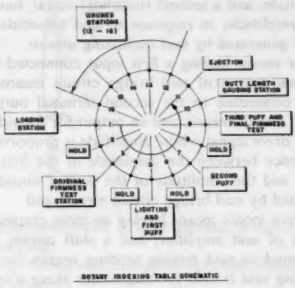
1. Apparatus for measuring sorption of water vapors by a variety of samples, comprising an exsiccator including a vessel defining a space having humidity standard liquid and vapor portions which is sealable from the surrounding atmosphere; means for maintaining the percentage of water vapors in said space at a predetermined value; at least one sample-confining container provided in the vapor portion in said space to absorb water vapors in said vessel; and means for agitating at least the vapor portion contents of said space, said agitating means including a shaft, means for rotatably supporting said shaft with a minimum of friction, impeller means mounted on said shaft in said vapor space, and means for rotating said shaft including a magnetic body on said shaft and means for selecting transmitting torque to said shaft via said magnetic body.

4,227,400

MEASURING CIGARETTE CHARACTERISTICS DURING PYROLYSIS SMOKING

John F. Nienow; Christopher L. Irving, and Lynwood V. Shaw, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed May 29, 1979, Ser. No. 43,454
Int. Cl.[3] G01N *3/48*
U.S. Cl. 73—81 25 Claims



ROTARY INDEXING TABLE SCHEMATIC

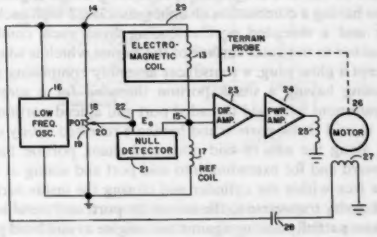
1. Apparatus for measuring the firmness of a cigarette comprised of a paper wrapped cylinder of tobacco during the smoking of same, said apparatus comprising
a holder for receiving the cigarette,
means for advancing said holder in stepwise movement to a succession of stations,
means for igniting and then effecting puffing of said cigarette at one of said stations, and
means located at a succeeding one of said stations for concurrently applying a first reference magnitude deflection force to said cigarette and a second greater magnitude deflection force to said cigarette, said means including signal generating devices associated with the application of the respective deflection forces for producing signals indicative of the extent to which the respective forces have deflected the wrapper.

4,227,401

SURFACE ELEVATION MEASURING APPARATUS

John C. McKechnie, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 15, 1979, Ser. No. 39,241
Int. Cl.[3] G01B *5/28*
U.S. Cl. 73—105 16 Claims



1. A surface elevation measuring apparatus comprising in combination:
terrain probing means for sensing the elevation of a terrain surface whose profile is being measured and followed;
oscillating means, having first and second outputs for gener-

ating a sinusoidal reference signal having a predetermined frequency;

bridge circuit means having a quartet of arms, with one of said arms being enclosed within said terrain probing means; and having a first input terminal connected to the first output of said oscillating means, a second input terminal connected to the second output of said oscillating means, a first output terminal, and a second output terminal for providing a first sinusoidal signal, having a fixed amplitude, and a second sinusoidal signal, having a variable amplitude, in response to said sinusoidal reference signal generated by said oscillating means;

amplifier means having a first input connected to the first terminal output of said bridge circuit means, a second input connected to the second terminal output of said bridge circuit means, and an output for providing a sinusoidal drive signal whose amplitude is proportional to the difference between the amplitude of the first sinusoidal signal and the amplitude of the second sinusoidal signal provided by said bridge circuit means; and

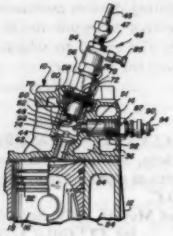
servo drive motor means having an input connected to the output of said amplifier, and a shift output effectively connected to said terrain probing means for raising or lowering said terrain probing means along a vertical axis above said terrain surface in response to the sinusoidal drive signal provided by said amplifier means.

4,227,402

COMBUSTION MONITORING SYSTEM FOR FUEL INJECTED ENGINES

Daniel J. Dooley, Burr Ridge; Terrence L. Dooley, and Joseph L. Dooley, both of Chicago, all of Ill., assignors to Creative Tool Company, Lyons, Ill.

Filed Nov. 14, 1978, Ser. No. 960,600
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—115 **18 Claims**



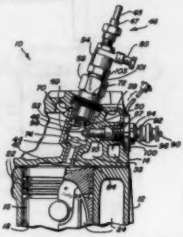
1. For use in a diagnostic system for a diesel engine of the type having a combustion chamber associated with each cylinder and a threaded port extending from each combustion chamber to the outer surface of the engine which is adapted to accept a glow plug, a transducer assembly comprising a metal housing having a shank portion threaded for a screw-type engagement with said threaded port and a head portion external to said shank portion and having a recessed cavity extending along the axis of said port, said shank portion having a forward end for extending into said port and acting as a pressure face within the cylinder and closing the inside surface of said cavity transverse to the axis of the port, said metal housing at least partially seating against said engine at said head portion and a piezoelectric element coupled to the inner end of the cavity in substantially the same plane in which said head portion is seated against said engine so as to develop an electrical signal during flexure of said housing resulting from pressure against said pressure face, and an electrical output means coupled to the outer end of said piezoelectric element for transmitting the electrical signal from said element.

4,227,403

CYLINDER PRESSURE MONITORING SYSTEM

Daniel J. Dooley, Burr Ridge; Terrence L. Dooley, and Joseph L. Dooley, both of Chicago, all of Ill., assignors to Creative Tool Company, Lyons, Ill.

Continuation-in-part of Ser. No. 960,590, Nov. 14, 1978, abandoned. This application Jan. 29, 1979, Ser. No. 7,347
Int. Cl.[3] G01M *15/00*
U.S. Cl. 73—115 **16 Claims**



1. A transducer for developing an electrical signal in response to pressure variations within the combustion chamber of an engine of the type having (a) a threaded port extending from the combustion chamber to the outer surface of the engine and (b) a glow or spark plug having a shank portion threaded into said port and an enlarged head portion exterior to said shank portion, said transducer comprising:

a housing sized and shaped for insertion around said shank portion while underlying said enlarged head portion, said housing having a thickness sufficient to insure that said glow or spark plug head portion compresses said housing against said engine and seats against said housing;

a piezoelectric element disposed within said housing for developing an electrical signal in response to pressure variations on said glow or spark plug from within said combustion chamber; and

terminal means for transmitting the electrical signal from said piezoelectric element.

4,227,404

DIGITAL MINERAL LOGGING SYSTEM

Jerry B. West, Tulsa, Okla., assignor to Century Geophysical Corporation, Tulsa, Okla.

Filed Apr. 17, 1978, Ser. No. 897,184
Int. Cl.[2] E21B *47/024*
U.S. Cl. 73—151 **10 Claims**

1. A digital mineral logging system for obtaining logging data from a single logging run through the borehole, comprising:

a mineral logging tool;

a plurality of mineral logging sensors housed within said mineral logging tool for obtaining the logging data on a single pass of the logging tool through the borehole, one of said sensors being a deviometer for determining the location and orientation of the borehole;

means for converting data from said sensors to a digital signal format;

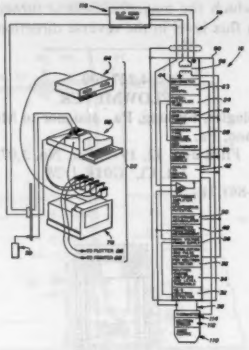
means for storing said digital signals of said sensors;

a cable connected at one end to said mineral logging tool for lowering and raising said mineral logging tool within the borehole and for energizing said sensors housed within said tool;

memory means within said mineral logging tool for storing a predetermined tool identification code;

an electronic digital signal processing means connected to said sensors of said mineral logging tool through said

cable for processing the data from said plurality of sensors; and



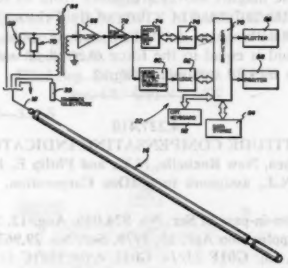
means for periodically transmitting said digital signal of said plurality of sensors and said tool identification code up said cable to said electronic signal processing means.

4,227,405

DIGITAL MINERAL LOGGING SYSTEM

Jerry B. West, Tulsa, Okla., assignor to Century Geophysical Corporation, Tulsa, Okla.

Division of Ser. No. 897,184, Apr. 17, 1978. This application Apr. 6, 1979, Ser. No. 27,676
Int. Cl.[3] E21B *47/022*
U.S. Cl. 73—151 **26 Claims**



26. A mineral logging tool connected by a cable to an electronic digital signal processing means for determining the true path of a borehole through an ore formation and for acquiring additional mineral logging data for a digital logging system during a single pass of the logging tool in the borehole, comprising:

a deviometer data sensor and at least one other mineral logging data sensor housed within the mineral logging tool for providing the mineral logging data on a single pass of the mineral logging tool through the borehole;

means for converting the deviometer sensor data and other analog sensor data from analog signals to digital signals;

means for storing said digital signals from said sensors; and

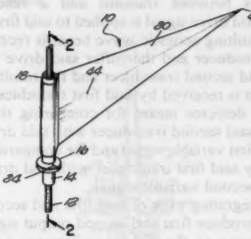
means for periodically batch transmitting said stored digital signals up the cable at a predetermined rate to the electronic digital signal processing means to perform computations to determine the location and orientation of the borehole and additional logging information from said other sensor.

4,227,406

WIND DIRECTION DEVICE

James M. Coffey, 320 E. Walnut Ave., El Segundo, Calif. 90245

Filed Apr. 27, 1979, Ser. No. 34,494
Int. Cl.[3] G01W *1/00*
U.S. Cl. 73—188 **14 Claims**



1. In combination with a boat shroud, a wind direction device comprising:

an upwardly facing shoulder secured to said shroud at a mid portion thereof;

a bearing resting on said shoulder and having a hole therethrough with a slit connecting said hole and the periphery of said bearing, said shroud passing through said hole, said bearing being made of a material of sufficient flexibility and resilience such that the size of said slit can be varied to position said bearing around said shroud and retain said bearing on said shroud;

a tubular mandrel engaging said bearing, said mandrel having a bore therethrough with a slit traversing the length of said mandrel connecting said bore and the periphery of said mandrel, said shroud passing through said bore, said mandrel being made of a material of sufficient flexibility and resilience such that the size of said slit in said mandrel can be varied to position said mandrel around said shroud and retain said mandrel on said shroud; and

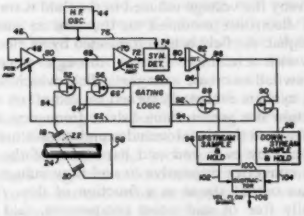
a resilient vane connected to the periphery of said mandrel.

4,227,407

VOLUME FLOW MEASUREMENT SYSTEM

Cornelis J. Drost, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,456
Int. Cl.[3] G01F *1/66*
U.S. Cl. 73—861.28 **13 Claims**



11. A flow measurement system for obtaining a resultant signal representative of the volume flow of a fluid stream, comprising:

first and second acoustic wave transducers adapted to be located adjacent the fluid stream, said transducers being so located that an acoustic wave beam transmitted by one transducer will pass through said fluid stream and will impinge on the other transducer;

means for generating a drive signal for activating said trans-

ducers, said drive signal being of an amplitude and frequency sufficient to drive said transducers to produce ultrasonic wave beams, said transducers each producing a wave beam of sufficient dimension to illuminate with uniform intensity tne entire cross section of the portion of the fluid stream to be measured;

control means for periodically and alternately switching said transducers between transmit and a receive modes, whereby said drive signal is applied to said first transducer and the resulting acoustic wave beam is received by said second transducer and thereafter said drive signal is applied to said second transducer and the resulting acoustic wave beam is received by said first transducer;

synchronous detector means for comparing the signal received by said second transducer with said drive signal to provide a first variable signal and for comparing the signal received by said first transducer with said drive signal to provide a second variable signal;

means for integrating each of said first and second variable signals to produce first and second output signals; and

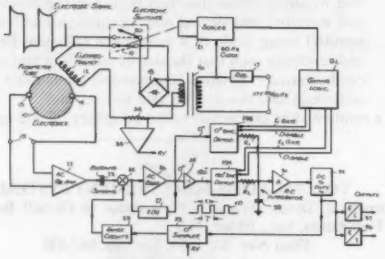
means responsive to the difference between said first and second output signals for producing a resultant signal which is proportional to the volume flow of said fluid stream.

4,227,408

HARMONIC NOISE SUPPRESSION IN ELECTROMAGNETIC FLOWMETER

Roy F. Schmoock, Yardley, and John S. Yard, Doylestown, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Dec. 7, 1978, Ser. No. 967,137
Int. Cl.[2] G01F *1/60*
U.S. Cl. 73—861.17 **8 Claims**



1. In an electromagnetic flowmeter in which fluid to be metered passes through a flow tube to intersect a magnetic field whereby the voltage induced in the fluid is transferred to a pair of electrodes mounted on the tube to yield a flow-induced signal, the field being established by an electromagnet supplied with excitation current through a periodically-operated switch to create a magnetic field which during each operating cycle is alternately turned on and off or reversed in flux direction at a predetermined drive frequency, as a consequence of which the signal includes undesirable noise components formed by even and odd harmonics of the drive frequency; a converter responsive to said flow-induced signal to produce an output signal as a function of flow rate that is substantially free of said noise components, said converter comprising:

A. a pair of synchronous demodulators;

B. means to apply said flow-induced signal to said demodulators in phase opposition;

C. an integrator coupled to the outputs of both demodulators; and

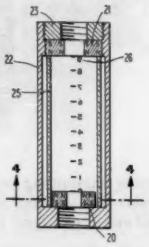
D. gating means synchronizing the demodulators with said periodically-operated switch to cause one demodulator to pass its output to said integrator during the first half cycle of the drive frequency only in a first gating interval in which the magnetic field is turned on and is at a constant flux level, and thereafter to cause the other demodulator to pass its output to said integrator during the second half cycle of the drive frequency only in a second gating interval in which the magnetic field is turned off or is at a constant flux level in the reverse direction.

4,227,409

FLOWMETER

Douglas J. Bingler, Furlong, Pa., assignor to Milton Roy Company, Ivyland, Pa.

Filed Jan. 12, 1979, Ser. No. 3,073
Int. Cl.[3] G01F *1/28*
U.S. Cl. 73—861.71 **5 Claims**



1. Apparatus for measuring the flow of a fluid through an untapered straight section of tube, the flow of said fluid through said apparatus being substantially linear, comprising:

a magnet being disposed within said tube at an end thereof and fixed with respect thereto and a magnet disposed within said tube and adapted to be moved along the axis of said tube from a rest position at an end of said tube in response to fluid passing through said tube, whereby said movable magnet moves a distance from its rest position under the influence of a flow of fluid through said tube such that the force exerted on said movable magnet by said fluid is equal to the force exerted on said movable magnet by said stationary magnet.

4,227,410

ATTITUDE COMPENSATING INDICATOR

Samuel Ruben, New Rochelle, N.Y., and Philip E. Kalker, Demarest, N.J., assignors to eMDee Corporation, Northvale, N.J.

Continuation-in-part of Ser. No. 824,046, Aug. 12, 1977. This application Apr. 13, 1979, Ser. No. 29,967
Int. Cl.[3] G01F *23/14;* G01L *4/04;* H01C *1/08*
U.S. Cl. 73—301 **20 Claims**

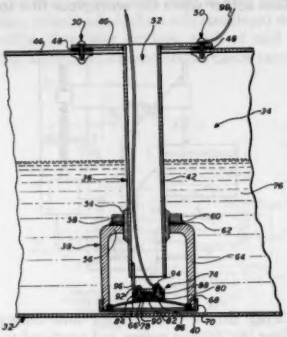
1. An indicator for measuring the liquid content of a container comprising:

an attitude compensating sensor comprising at least two variable resistor assemblies individually mounted at opposite ends of said container and disposed for electrical series connection with each other,

each resistor assembly comprising a housing mounted within said container and attached to one wall thereof, said housing comprising a fluid-tight chamber supported and located near the bottom of said container, said chamber having at least one stationary wall and at least one movable wall, said movable wall capable of movement with respect to said stationary wall in response to changes in liquid weight, a weight-responsive variable resistor mounted within said chamber in contact with said stationary wall and said movable wall, and a conduit providing fluid registry between said chamber and the ambient atmosphere outside said container, said conduit mechanically supporting said chamber within said container, said conduit attached at one end thereof to said stationary wall,

and extending into attachment at the other end thereof to a wall of said container,

an electrical connection means extending into contact between said resistor assemblies,



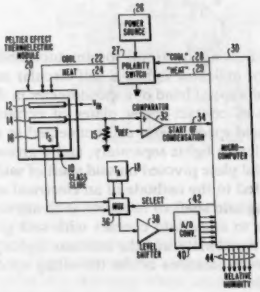
wherein the movement of said movable wall causes a change in the electric current output of said resistor and the total resistance of said sensor received from each of said variable resistor assemblies remains constant for a particular level of liquid content.

4,227,411

RELATIVE HUMIDITY MEASUREMENT

Abe Abramovich, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 24, 1979, Ser. No. 77,913
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—336.5 **9 Claims**



1. A relative humidity measuring instrument, comprising

two spaced electrodes on an insulating substrate,

a substrate thermometer and an ambient thermometer,

means to cool, and then heat, said substrate,

a comparator connected to said electrodes to detect a decrease in resistance between said electrodes due to condensation of moisture therebetween, and

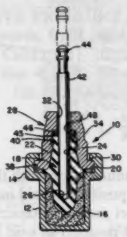
a computer receptive to temperature signals from said thermometers and operative in response to an output from said comparator to compute the relative humidity.

4,227,412

TEMPERATURE RESPONSIVE ACTUATOR

Eugene Stratynski, West Chicago, and Charles Zilic, Mt. Prospect, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 16, 1979, Ser. No. 30,596
Int. Cl.³ G01K *5/32*
U.S. Cl. 73—368.3 **7 Claims**



1. A temperature responsive actuator, comprising:

(a) housing means defining a cavity, said housing means including a cup-shaped base member and a guide casing connected to said base member, said guide casing having a first opening formed therethrough and a registration surface provided within said cavity adjacent said first opening;

(b) a flexible diaphragm disposed within said cavity and sealingly connected around the outer periphery thereof to said housing means;

(c) thermally expansible material received in said cavity intermediate said base member and said diaphragm;

(d) an elongated actuator member having one end received through said first opening in said guide casing and operably connected to said diaphragm for movement therewith, said actuator member having an outer diameter sized to define a first clearance with said opening in said guide casing;

(e) an anti-chafe member having an opening therethrough with said actuator member slidably received therethrough, said member having surface portions thereof in abutment with said diaphragm; and

(f) a rigid support washer having a central guide passage therethrough, said washer having said actuator rod slidably received therethrough, said actuator rod outer diameter defining with said guide passage a second clearance substantially less than said first clearance, said washer having face portions thereof in abutment with said anti-chafe member and said guide casing, said washer having the outer periphery thereof defining with said registration surface a third clearance substantially less than said first clearance to permit a predetermined amount of radial movement thereof, wherein said washer substantially limits the radial play of said actuator member relative to said first opening in said guide casing and wipes contaminant build-up from portions of the periphery of said actuator member, said washer providing axial support for said anti-chafe ring, said second and third clearance surfaces sized to prevent said actuator member from contacting the inner periphery of said first opening.

4,227,413

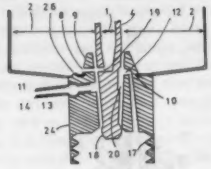
URINE SPECIMEN COLLECTOR

Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301

Filed Jan. 10, 1979, Ser. No. 2,403
Int. Cl.³ G01N *1/18*
U.S. Cl. 73—421 R **6 Claims**

1. An aliquot sampling apparatus comprising: an outer elongate container having an upper inlet and a bottom outlet port; an inner elongate container spaced from the outer container

and concentric therewith to provide an annular chamber therebetween, said inner container having a bottom access port; resilient sealing valve means at the bases of said containers and connected thereto, said resilient valve means snapped into the base of said outer container; first and second outlet means, said inner container being adjustable in said valve means to position



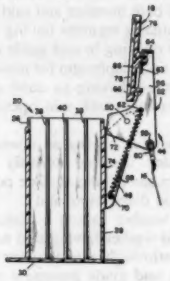
said access port for communication with the outlet port of said outer container in a first position of said inner container; and to position said access port in communication with said first outlet means in a second position of said inner container, said second position also positioning the outlet port of said outer container in communication with said second outlet means.

4,227,414

LIQUID TESTING KIT

Joseph R. Elkins, Brooklyn, N.Y., assignor to J & M Instruments Corp., Farmingdale, N.Y.

Filed May 2, 1979, Ser. No. 35,330
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—425.4 R **15 Claims**



1. A kit for rendering an in situ property measurement of a liquid, said kit comprising a vessel adapted to be lowered into the liquid, the vessel having an open mouth for receiving a specimen of the liquid and an instrument for measuring the liquid property, the vessel being so dimensioned as to accommodatingly receive the instrument, the vessel including a plurality of ribs projecting inwardly and defining an area for supporting the instrument, the instrument including a pair of electrodes, the ribs being spaced from the electrodes so as to permit intimate contact between the liquid specimen and the electrodes whereby accurate measurement is facilitated.

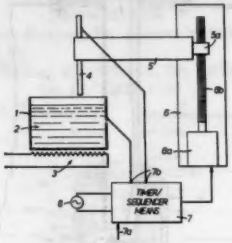
4,227,415

METHOD AND APPARATUS FOR TESTING SOLDERABILITY AND DE-SOLDERING WICKS

Ernst Spirig, P.O. Box 160, CH-8640 Rapperswil, Switzerland

Filed Jul. 16, 1979, Ser. No. 58,119
Claims priority, application United Kingdom, Jun. 26, 1979, 79/22181
Int. Cl.³ G01M *19/00*; G01N *33/00*
U.S. Cl. 73—432 R **7 Claims**

1. Testing apparatus for solderability and de-soldering wick tests, comprising holder means for holding a workpiece to be tested, drive means for driving the holder means selectively up and down, a molten solder bath into which the workpiece is dipped as the drive means drives the holder means first downwards and then upwards, an electrical circuit coupled to the workpiece and solder bath and completed through the workpiece and molten solder when the workpiece first touches the



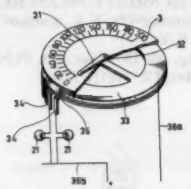
solder upon being driven downwards, and timing control means controlling the driving means and arranged to continue the downwards driving of the holder means for a predetermined interval after said circuit is completed, then to maintain the holder means stationary for a predetermined time period, and finally to raise the holder means so that the workpiece leaves the molten solder.

4,227,416

SPEED INDICATING APPARATUS FOR AUTOMOBILE

Jiunn-Feng Lee, 4th Fl., 103, Sec. 2, Wu-Chang St., Taipei, Taiwan

Filed May 24, 1979, Ser. No. 42,120
Int. Cl.³ G01P *3/50, 1/11*
U.S. Cl. 73—499 **4 Claims**



1. A speed indicating apparatus for an automobile comprising a plurality of indicator lights, a half-circular magnet pivoted on a shaft of a speed hand of a speedometer in the automobile, a plurality of contact metal plates of certain elasticity situated below said speedometer and connected to a lead wire of each said indicator lights separately, and a ground connection circular metal plate pivoted on said shaft of said speedometer and connected to the cathode of an electrical source; said magnet following said shaft to rotate so as to attract said contact metal plates to come into contact with said ground connection circular metal plate, and the indicator lights glowing in turn so as to give indications of the travelling speed to other drivers at all times.

4,227,417

DYNAMIC FOCUSING APPARATUS AND METHOD

William E. Glenn, Ft. Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,005
Int. Cl.² G01N *29/00*
U.S. Cl. 73—625 **29 Claims**

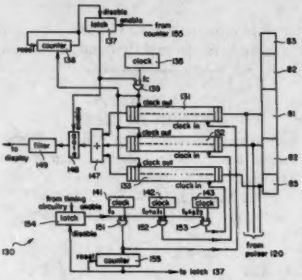
1. Apparatus for imaging a body, comprising:
means for transmitting energy into the body; p1 a transducer for converting energy reflected from said body to electri-

cal signals, said transducer being divided into a plurality of defined segments;

a plurality of register devices, the input of each of said register devices being coupled to a respective one of said transducer segments;

a first clock associated with each of said register devices;

a plurality of second clocks, each associated with one of said plurality of register devices, each of said second clocks having a different characteristic clock rate;



timing means for effecting clocking of said electrical signals from said segments into their respective devices with one of its associated clocks and for subsequently effecting the clocking of the stored information out of each of said devices with the other of its associated clocks; and

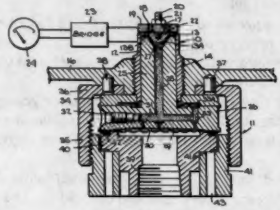
means for combining the signals clocked out of said devices to form an image-representative signal.

4,227,418

CAPACITIVE PRESSURE TRANSDUCER

John J. Bonner, Philadelphia, and C. William Clayton, Hatboro, both of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Sep. 24, 1979, Ser. No. 78,203
Int. Cl.³ G01L 9/12
U.S. Cl. 73—706 **9 Claims**



1. A capacitive pressure transducer for measuring fluid pressure comprising:

A. a pressure sensor formed by a cylinder having one end enclosed by a deformable metal diaphragm that serves as one plate of a capacitor whose second plate is spaced from the diaphragm by an air gap constituting the dielectric of the capacitor, deformation of the sensor diaphragm in response to pressure acting to vary the air gap to produce a corresponding change in the value of the capacitance; and

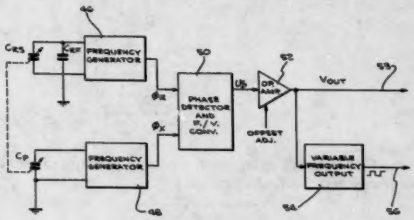
B. a coupling assembly adapted to hydraulically convey the pressure of the fluid to be measured to the pressure sensor while isolating the structure of the sensor from the fluid, said assembly including a body component having a column section and a base section, the column section being received within the cylinder with its head spaced from the sensor diaphragm to define therewith a sensor chamber which communicates through a passage in the column section with an isolation chamber formed at the bottom of the base section and sealed by a barrier diaphragm, the chambers and the passage being filled with hydraulic fluid whereby the pressure of fluid imposed on the barrier diaphragm is transferred to the sensor diaphragm.

4,227,419

CAPACITIVE PRESSURE TRANSDUCER

Kyong Park, Chatsworth, Calif., assignor to Kavlico Corporation, Chatsworth, Calif.

Filed Sep. 4, 1979, Ser. No. 72,016
Int. Cl.³ G01L 9/12
U.S. Cl. 73—724 **13 Claims**



1. An accurate pressure transducer system comprising:

transducer means including a main variable capacitor and having a diaphragm including a conductive plate for deflecting toward and away from a second conductive plate in response to variations in pressure with the variations in capacitance being slightly non-linear over the desired operating pressure range;

a reference capacitance, said reference capacitance including a principal fixed capacitor, and a small variable correction capacitor having a capacitance which is a minor fraction of that of said main variable capacitor;

means for mounting said small variable compensation capacitor to change its capecitance in response to the variations in pressure applied to said main variable capacitor; and

means for comparing the capacitance of said main variable capacitor and said reference capacitance and for producing an output signal of increased linearity through compensation provided by the variable correction capacitor.

4,227,420

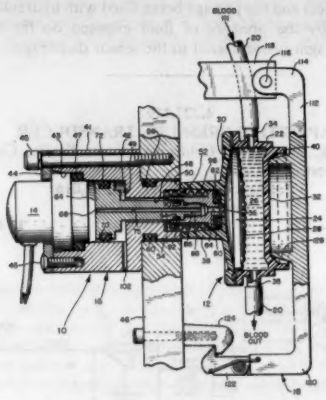
PRESSURE COUPLING MECHANISM IN A PRESSURE MONITORING ASSEMBLY

Rene G. Lamadrid, Bethesda, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 11, 1979, Ser. No. 47,568
Int. Cl.³ G01L 7/08
U.S. Cl. 73—756 **32 Claims**

1. Pressure coupling means for coupling a first chamber in a fluid pressure transfer device to a pressure transducer, the chamber having one wall thereof defined by a flexible diaphragm against which fluid pressure to be monitored acts, for establishing a fluid tight air passageway communicating the first chamber in the pressure transfer device to the pressure transducer and for establishing, when coupled between the pressure transfer device and the pressure transducer, a biasing force in said air passageway and the first chamber whereby the diaphragm is urged toward the fluid to be monitored so that when such fluid is present at its expected normal pressure, the diaphragm is in a relaxed unstretched state, said pressure coupling means comprising means for trapping a volume of air in said air passageway and the first chamber when said pressure

coupling means is coupled to the pressure transfer device and means for compressing the volume of air in said air passageway



and the first chamber to establish a biasing pressure in said air passageway and the first chamber.

4,227,421

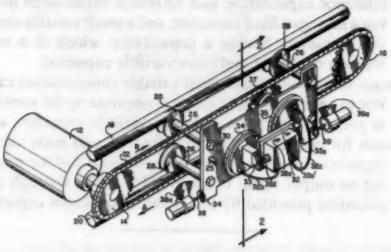
CARRIAGE RECIPROCATOR AND POSITIONER WITH CONTINUOUSLY MOVING CHAIN

Joseph F. Weishew, 3934 Davisville Rd., Hatboro, Pa. 19040

Filed Mar. 20, 1978, Ser. No. 888,190

Int. Cl.[2] F16H *21/16, 19/06*

U.S. Cl. 74—27 **4 Claims**



1. A carriage reciprocator comprising:

a housing;

a carriage movably mounted on said housing;

a chain movably mounted on said housing and arranged to continuously present a first chain portion, moving in a first direction, to a first portion of said carriage and to present a second chain portion, moving in a second direction, to a second portion of said carriage;

means, secured to the housing, for moving said chain;

a first chain sprocket rotatably mounted on said carriage, and arranged to operatively engage said first chain portion and arranged to normally idly spin with chain motion;

a second chain sprocket rotatably mounted on said carriage, and arranged to operatively engage said second chain portion and arranged to normally idly spin with chain motion;

a first air brake secured to said carriage and arranged to permit the spinning of said first chain sprocket when in a first state and to prevent the spinning of said first chain sprocket when in a second state;

a second air brake secured to said carriage and arranged to permit the spinning of said second chain sprocket when in a first state and to prevent the spinning of said second chain sprocket when in a second state;

an air control valve secured to said carriage, operatively connected to said first and second air brakes, and arranged to shift between first and second control states wherein said first air brake is in its first state and said second air brake is in its second state when said air control valve is in said first control state and wherein said first air brake is in its second state and said second air brake is in its first state when said air control valve is in said second control state; and

means movably mounted on said housing for shifting said air control valve between said first and second control states.

4,227,422

CHAIN DEVICE

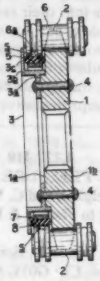
Yoshinori Kawashima, Sakado, and Masaki Watanabe, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1979, Ser. No. 40,437

Claims priority, application Japan, May 19, 1978, 53/67297[U]

Int. Cl.[3] F16H *55/30*

U.S. Cl. 474—156 **7 Claims**



1. a chain device comprising:

a sprocket wheel;

a buffer ring provided on one side of said sprocket wheel for rotation relative thereto;

a chain meshing with said sprocket wheel, said chain including a plurality of link plate pairs;

said buffer ring having an outer diameter greater than the inner diameter dimension of a semicircular-shaped portion of said chain which is in mesh with said sprocket wheel; and

each of said link plates being provided with a depressed portion having a curved shape coinciding, in the radius of curvature thereof, with the maximum radius of curvature of the outer periphery of said buffer ring when said buffer ring is deformed into an elliptical shape by meshing engagement between said chain and said sprocket wheel.

4,227,423

LINE GRIPPING PULLEY FOR A LINE HAULER

Robert E. Crowe, Rockland Industrial Park, Rockland, Me. 04841

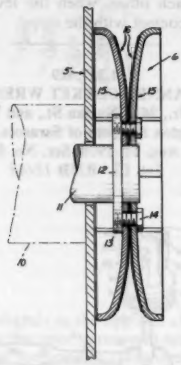
Filed Apr. 21, 1978, Ser. No. 898,641

Int. Cl.[2] F16H *55/36, 55/46*

U.S. Cl. 474—177 **4 Claims**

1. A line gripping pulley for a line hauler for marine use, having a drive shaft with a free end and a flange close to but adjacent said end, said pulley including a pair of identical metal backing discs and a pair of identical thin and resilient and relatively flexible steel wear discs, one for each braking disc, each backing disc including an inner flat portion, an intermedi-

ate portion that is inclined away from the plane defined by the inner portion, and an outer portion sharply curved to provide a rim extending away from said plane, each wear disc including an inner flat portion to overlie the inner portion of a backing disc and an outer portion dimensioned to overlie the intermediate portion thereof, the flat portions of each disc having an axial hole to accommodate said shaft end and a circular series of holes enabling said discs to be bolted to said shaft flange



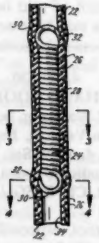
with the wear discs proximate and said rims disposed away from each other, the intermediate portion of the backing disc holding the outer portions of the wear disc to provide a narrow, V-shaped line receiving and line gripping channel dimensioned at its mouth freely to receive the line, at least the marginal portions of the wear discs resiliently engaging and sealing the intermediate portions of the backing discs adjacent their rims.

4,227,424

UNIVERSAL DRIVE BELT

Alvin E. Schleappe, Star Rte. 1, Box 212, Fredericktown, Mo. 63645

Filed Nov. 2, 1978, Ser. No. 956,890
Int. Cl.³ F16B 7/00; F16G 9/00
U.S. Cl. 474—256 **4 Claims**



3. An endless drive belt for use as a fan belt or the like comprising:

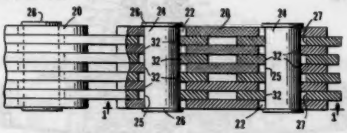
a length of flexible reinforced tubing, said tubing having a sidewall defining a hollow core extending along at least part of the interior thereof, said tubing having its ends fastened together with a fastener, said fastener including a length of coiled spring, a semicircular head formed in each end thereof, the diameter of said heads being larger than the diameter of said hollow core, said heads having means to resist removal from said hollow core including a pointed tip formed into the end of said head, said pointed tip being oriented to slide freely into the hollow core but dig into the sidewall in response to a force tending to remove said head from said tubing, said pointed tips cooperating with said coiled spring to resiliently resist rotation of one end of tubing with respect to said spring and the other end of tubing.

4,227,425

SINGLE ROCKER JOINT DRIVE CHAIN

Wilfrid H. Bendall, Saybrook Rd., Essex, Conn. 06426

Filed Apr. 4, 1979, Ser. No. 26,830
Int. Cl.³ F16G 13/02
U.S. Cl. 474—213 **6 Claims**



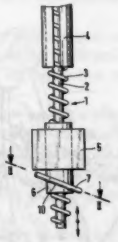
1. A rocker joint drive chain comprising a plurality of apertured link members assembled end to end with overlapping end portions and registering apertures interconnected by pivot pins extending through the apertures and constituting pitch centers for a pivotal rocking action of the links on the pins, said apertures being substantially larger than the pins to provide clearance for the rocking action and for removal of the pins, said pins having end portions larger than the pin portions between their end portions and constituting chain transverse assembly retention means, said end portions also being smaller than the link apertures to facilitate insertion and removal therethrough, said pins being free to rotate independently of the link rocking action, the pin centers thereof constituting the center to center pitch dimension of an assembled chain.

4,227,426

DEVICE FOR LONGITUDINAL DISPLACEMENT OF A FLEXIBLE DRIVE WIRE

Wilfried Schwanz, Ahnsen, and Ulrich Seiffert, Braunschweig, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed May 11, 1979, Ser. No. 38,192
Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821153
Int. Cl.² F16H 1/20
U.S. Cl. 74—424.8 R **5 Claims**

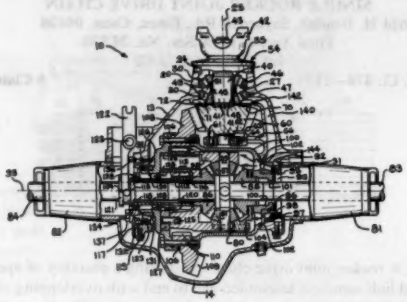


1. A device for driving a flexible wire having a helical coil therearound along its length comprising a hollow shaft adapted to receive the wire, motor means for rotating the hollow shaft in either direction about its longitudinal axis, and wherein said shaft has a projection extending into the interior of said shaft adapted to engage said wire in the gap between adjacent turns of the helical coil, such that upon rotation of said shaft and thereby said projection, the wire is driven longitudinally through said shaft.

4,227,427
DRIVE UNIT ASSEMBLY

Wesley M. Dick, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Sep. 8, 1977, Ser. No. 831,588
Int. Cl.[3] F16H *57/04*; F01M *1/00*
U.S. Cl. 74—467 8 Claims

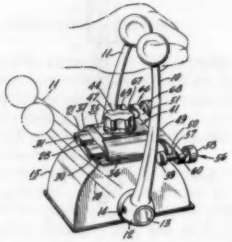


1. A drive unit comprising a housing for containing a body of lubricant, said housing having a shaft opening; a gear assembly positioned within said housing; a shaft axially extending through said shaft opening and rotatable about said axis, said shaft spaced from said gear assembly; an annular baffle rigidly affixed to an axially inner portion of said shaft and positioned axially inwardly of said shaft opening, said baffle rotatable with said shaft about said axis; a bearing assembly positioned between said shaft opening and said baffle, a generally annular lubricant chamber at least partially defined by said baffle and said bearing assembly, said annular chamber being generally closed, and a lubricant passageway having an inlet in communication with said lubricant chamber and an outlet adjacent said gear assembly said inlet axially positioned between said baffle and said bearing assembly.

4,227,428
THROTTLE SYNCHRONIZER FOR INTERNAL COMBUSTION ENGINES

Morton F. Zifferer, and Donald E. Flinchbaugh, both of York, Pa., assignors to Mordo Company, Mount Joy, Pa.

Filed Jan. 17, 1979, Ser. No. 4,015
Int. Cl.[3] G05G *5/04*
U.S. Cl. 74—526 9 Claims



1. A throttle synchronizer for plural internal combustion engines, each engine having a separate throttle valve control lever mounted for selected forward and reverse longitudinal movement relative to a fixed location, said throttle synchronizer comprising

(a) a support extending longitudinally in the direction of movement of the levers,

(b) a transverse yoke mounted slidably on the support with capacity for selected longitudinal positioning relative to the support,

(c) locking means for locking the yoke securely in a selected position on the support,

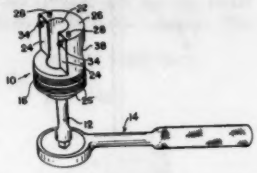
(d) throttle lever stops mounted on the yoke, said stops limiting the forward movement of the levers, and

(e) adjustment means for the throttle lever stops to permit the levers to be maintained in synchronous engine settings relative to each other, when the levers have been advanced into contact with the stops.

4,227,429
SPANNER SOCKET WRENCH

William Bowers, Jr., 2425 Nassau St., and William L. Grooms, Jr., 3307 Lexington St., both of Sarasota, Fla. 33581

Filed Aug. 14, 1978, Ser. No. 933,277
Int. Cl.[3] B25B *13/48*
U.S. Cl. 81—90 C 4 Claims



1. A spanner socket comprising a tubular body member open at one end forming a partially annular face and having an end wall at the other end, a lateral cut-out portion forming a pair of co-planar lateral faces, disposed proximate said one end, a polygonal aperture through said end wall for engagement by a polygonal driver, a pair of adjustable cylindrical pins outwardly projecting from said at least partially annular end face, said pins being slidably and removably disposed each in one of a pair of substantially parallel longitudinal bores diametrically opposed, a compressed coil spring disposed in each of said bores below each of said pins and longitudinally urging each of said pins in a direction causing each of said pins to project from said partially annular end face, and means for locking said pins in position each in one of said bores, said means for locking said pins in position comprising a set screw for each of said pins passed through from each of said lateral surfaces through a threaded bore leading in said bore accepting said pin.

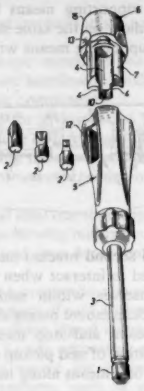
4,227,430
HAND TOOL

Conny Jansson, and Ulf Wahlberg, both of Enköping, Sweden, assignors to AB Bahco Verktyg, Enköping, Sweden

Filed Jun. 4, 1979, Ser. No. 45,192
Claims priority, application Sweden, Jun. 30, 1978, 7807425
Int. Cl.[3] B25G *1/08*
U.S. Cl. 81—177 M 2 Claims

1. A rotatable hand tool, especially a screwdriver, with a handle having a holder (1) for a tool bit (2) at one end and formed with handle cavities (4) for storing at least one such bit (2) which fits the holder (1), characterized in that the handle consists of an outer tubular part (5) also forming one end of the handle, and a rotor (6) accommodated in the tubular part (5), said rotor simultaneously forming the opposing free end of the handle, the cavities (4) being disposed about the rotor (6) and consisting of radial recesses in the periphery thereof, while the tubular part has an opening (12) which, by mutual rotation between the rotor (6) and the tubular part (5) can be localized radially outside an optional recess (4) in the rotor, thereby allowing removal and replacement of a bit from and into the rotor, said rotor (6) being movably connected to the tubular part (5) with limited axial movement, their being coacting locking means (13, 14) on the rotor and in the tubular part

disposed such that when rotor and tubular part are pressed axially towards each other, the rotor and tubular part are non-rotatably locked to each other, and when rotor and tubular part are moved slightly in the opposite axial direction said locking means allow the rotor to rotate in relation to the tubular part for adjusting the opening (12) therein the relation to the recesses (4) in the rotor.

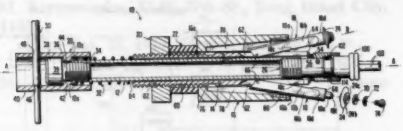


4,227,431

AXIAL TUBE CUTTER FOR SEVERING ELECTRICAL CONNECTOR COUPLING RINGS

Royzell F. Wells, Littleton, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Feb. 8, 1979, Ser. No. 10,344
Int. Cl.³ B23B 5/14
U.S. Cl. 82—76 **13 Claims**



1. An apparatus for circumferentially severing a tubular bayonet coupling ring of an electrical connector plug or the like, said mechanism comprising:

an elongated cylindrical mandrel,

a tubular carrier concentrically mounted on said mandrel and slidable thereon,

a dummy electrical connector receptacle fixedly mounted on one end of said mandrel for detachably receiving said bayonet coupling ring,

means forming a longitudinal stop for said carrier against biasing movement,

biasing means for biasing said carrier axially towards said dummy receptacle,

a plurality of circumferentially spaced spindles hinge mounted at one end to said carrier for pivoting angularly with respect to said carrier axis,

a slide closer concentrically surrounding said carrier, being axially displaceable thereto and having cam surface means contacting said spindles to cause said spindles to pivot towards said dummy receptacle, and

cutter wheels mounted for rotation on the other ends of said spindles;

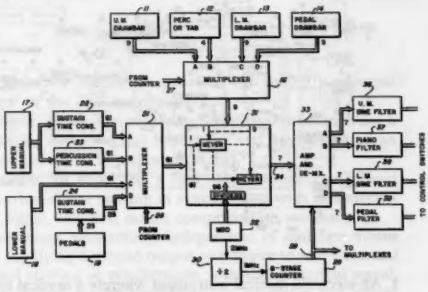
whereby, said cylindrical mandrel may be first shifted axially with respect to said carrier against said biasing means to project said dummy receptacle axially beyond the cutter wheels to permit said bayonet coupling ring of said connector plug to be concentrically mounted upon said dummy receptacle; secondly, upon release of said mandrel, said mandrel shifts axially to position said ring in proper axial cutting position with respect to said cutter wheels; thirdly, said slide closer may be shifted towards the end of said mandrel bearing said bayonet coupling ring to cause said cutter wheels to be pressed into contact with the periphery of said bayonet coupling ring, and rotation of said slide closer and said tubular carrier with respect to said elongated cylindrical mandrel causes said cutter wheels to sever said bayonet coupling ring into multiple axial segments.

4,227,432

ELECTRONIC MUSICAL INSTRUMENT HAVING MULTIPLEXED KEYING

Brian M. Bagus, Bartlett, Ill., assignor to Marmon Company, Chicago, Ill.

Filed Feb. 23, 1978, Ser. No. 880,819
Int. Cl.² G10H 1/00
U.S. Cl. 84—1.01 **10 Claims**



1. An electronic musical instrument comprising:

a plurality of key down selection sources, each having a group of key down output lines and each providing key down selection signals on respective ones of said group of key down output lines;

first multiplexer means having a plurality of first multiplier output lines for time division multiplexing different ones of said key down selection signals from selected ones of said groups of key down output lines into a plurality of time intervals on each of said plurality of first multiplexer output lines;

a plurality of analog harmonic signal sources, each having a group of harmonic output lines and each providing harmonic value signals on respective ones of said group of harmonic output lines;

second multiplexer means having a plurality of second multiplexer output lines for time division multiplexing different ones of said harmonic value signals from selected ones of said groups of harmonic output lines into a plurality of time intervals on each of said plurality of second multiplexer output lines;

a top octave signal source having a plurality of top octave output lines and providing various frequency range signals on each of said top octave output lines;

a plurality of keyer means each having a keyer output line and each being coupled to said first multiplexer means for receiving a different one of said time division multiplexed key down signals, to said second multiplexer means for receiving said time division multiplexed harmonic value signals and to said top octave signal source for receiving selected ones of said various frequency range signals;

each of said plurality of keyer means providing on said keyer output line a time divisioned multiplexed signal related to

said selected various frequency range signals received by said keyer;

demultiplexer means having a plurality of demultiplexer output lines and being coupled to said plurality of keyer means for receiving said time division multiplexed signals related to said selected various frequency range signals received by each said keyer and providing on said plurality of demultiplexer output lines a plurality of demultiplexed output signals; and

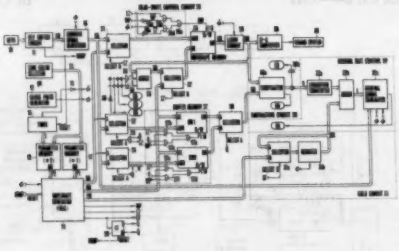
output circuit means coupled to said demultiplexer means for receiving said plurality of demultiplexed output signals and producing a plurality of audio frequency range signals.

4,227,433

ELECTRONIC MUSICAL INSTRUMENTS

Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 18, 1979, Ser. No. 76,561
Int. Cl.³ G10H *1/06, 7/00*
U.S. Cl. 84—1.01 **9 Claims**



1. An electroic musical instrument wherein a musical tone is generated by repeatedly reading out amplitude values at sampling points in one period of a musical tone waveshape stord in a first waveshape memory device at a period corresponding to a tone pitch of a depressed key, said electronic musical instrument comprising;

a second waveshape memory device for storing amplitude values at sampling points in one period of a new musical tone waveshape to be generated subsequent to said musical tone waveshape stored in said first waveshape memory device;

first calculating means for calculating differences in amplitude values at sampling points stored in corresponding addresses of said first and second waveshape memory devices respectively;

renewal rate control means for generating a waveshape renewal signal having a period corresponding to difference information produced by said first calculating means; and

renewal means for effecting renewal of the memory content of said first waveshape memory device at a speed corresponding to the period of said waveshape renewal signal.

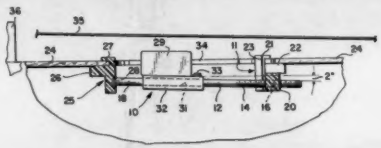
4,227,434

ADJUSTABLE SOUNDHOLE MOUNT FOR A MUSICAL PICKUP

Lawrence P. DiMarzio, 210 Davis Ave., Staten Island, N.Y. 10310

Filed Feb. 21, 1978, Ser. No. 879,206
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.14 **13 Claims**

1. An adjustable soundhole mount for a stringed musical instrument pickup comprising a first bracket, said first bracket including means to engage the perimeter of an instrument soundhole, a second bracket, said second bracket including means to engage the perimeter of said soundhole, pickup mount supporting means, said pickup mount supporting means comprising two parallel elements, said pickup mount supporting means extending from one of said brackets, said pickup mount supporting means include a length extending means, said pickup mount supporting means being parallel to the strings on said instrument on the same slope, means to engage said pickup mount supporting means with said other bracket,



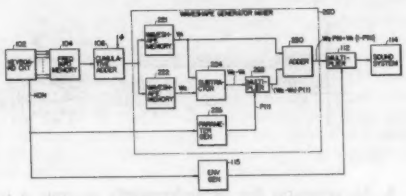
said first bracket and second bracket and pickup mount supporting means adapted to interact when mutually engaged to firmly support themselves within said soundhole, pickup mount means, said pickup mount means slidable on said pickup mount supporting means, and stop means, said stop means adapted to fix the position of said pickup mount means on said pickup mount supporting means along its length.

4,227,435

ELECTRONIC MUSICAL INSTRUMENT

Shigeo Ando, Iwata, and Takayasu Kondou, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 20, 1978, Ser. No. 898,523
Claims priority, application Japan, Apr. 28, 1977, 52-48412; May 9, 1977, 52-51970
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.19 **6 Claims**



1. An electronic musical instrument of a waveshape memory type, comprising:

a plurality of waveshape memories for storing different waveshapes which are identical in fundamental wave but different in harmonic components;

tone-identifying means for giving access to said waveshape memories to reproduce different waveshape signals;

mixing means for mixing these different waveshape signals together respective mixing coefficients determined by time-dependent parameter generating means, and for generating a resulting composite waveshape signal consisting of signal components each representing each of said different waveshapes and being in a linear relationship with each of said mixing coefficients which are respectively such functions of time that the total sum of all of such functions is alsways held constant, at least one of said mixing coefficients being multiplied by at least one of said different waveshape signals;

means for imparting an amplitude envelope to said composite waveshape signal for time-dependent controlling of tone amplitude; and

means for converting said composite waveshape signal into a corresponding musical tone, thereby attaining separate time-dependent controlling of tone color and of tone amplitude.

2. An electronic musical instrument of a waveshape memory type, comprising:

a plurality of waveshape memories for storing different waveshapes which are identical in fundamental wave but different in harmonic components;

tone-identifying means for giving access to said waveshape memories to reproduce different waveshape signals;

mixing means for mixing these waveshape signals delivered from said plurality of waveshape memories, which mixing means comprising:

means for generating at least one time-dependent parameter,

arithmetic means for achieving multiplication on said waveshape signals with said time-dependent parameter or parameters, and

means for generating a composite waveshape signal in accordance with an output of said arithmetic means so that the composite waveshape signal comprises said different waveshape signals having respective mixing coefficients determined by said means for generating at least one time-dependent parameter, each of said mixing coefficients being such a function of time that the total sum of all of such functions is always held constant, at least one of said mixing coefficients being multiplied by at least one of said different waveshape signals;

means for imparting an amplitude envelope to said composite waveshape signal for time-dependent controlling of tone amplitude; and

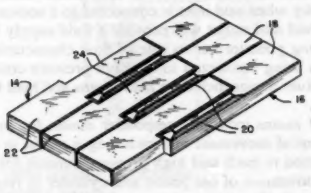
means for converting a resulting envelope-imparted composite waveshape signal into a corresponding musical tone, thereby attaining separate time-dependent controlling of tone color and of tone amplitude.

4,227,436

MUSICAL INSTRUMENT KEYBOARD

Dmytro M. Kryzanowsky, 32-85 37th St., Long Island City, N.Y. 11103

Filed Nov. 20, 1974, Ser. No. 525,370
Int. Cl.³ G10C *3/12*
U.S. Cl. 84—423 A **2 Claims**



1. In a keyboard for a musical instrument of the type including a plurality of keys adapted for connection to means for producing the twelve fundamental tones in an octave, each key corresponding to a different one of said tones, said keyboard being of the type including a plurality of keys having upper surfaces for manipulating said keys to activate said tone producing means, the improvement comprising:

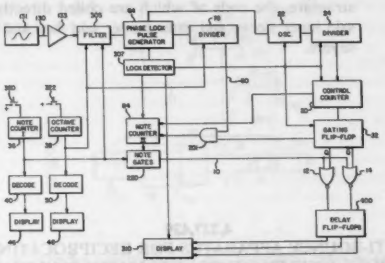
said keys being arranged in two confronting rows, each key having a main part and an extension, said rows being arranged with said main parts on opposite sides of said keyboard with their upper surfaces in a common plane with said extensions interleaved therebetween, the upper surfaces of the extensions in one of the rows of keys being raised relative to the upper surfaces of the extensions in the other row of keys which lie in said plane, whereby said keys may be connected to said tone producing means with the extensions of said keys corresponding to continuously increasing tones from one end of said keyboard to the other.

4,227,437

FREQUENCY DETECTING APPARATUS

Thomas L. Inloes, 032 SW. Seymour, and Darwin E. George, 031 SW. Slavin, both of Portland, Oreg. 97201

Filed Oct. 11, 1977, Ser. No. 841,004
Int. Cl.² G10G *7/02*
U.S. Cl. 84—454 **18 Claims**



16. Frequency detection apparatus for tuning a stringed instrument or the like, comprising:

transducer means for receiving sound information from a vibrating string on said instrument and for generating an electrical signal in response thereto,

first means for supplying a first output responsive to said electrical signal starting in synchronism with said electrical signal, said first means comprising an oscillator,

second means substantially independent of said first means for supplying a second output responsive to said electrical signal starting in synchronism with said electrical signal, said second means comprising an oscillator and means responsive to said electrical signal for starting oscillation of the last mentioned oscillator in synchronism with said electrical signal,

the first means being responsive to said electrical signal to provide a first output indicative of the frequency of said electrical signal, and the second means providing a standard second output signal, and

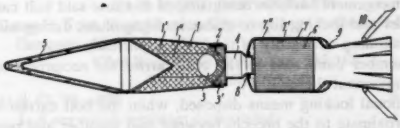
comparison means for comparing said first output with a predetermined number of cycles of said second output signal to provide an indication whether the first output substantially matches a predetermined standard.

4,227,438

WEAPON SYSTEM, NOTABLY INFANTRY ANTI-TANK WEAPON

Michel Precoul, Paris, France, assignor to Societe d'Etudes, de Realisations et d'Applications Techniques, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,570
Claims priority, application France, Sep. 9, 1977, 77 27285
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.816 **6 Claims**



1. A disposable anti-tank weapon system for infantry comprising

I. a launching tube acting as a sealed container and

II. a rocket propelled projectile unit comprising

A. an explosive head,

B. a rocket propulsion unit and

C. a fuse which interconnects the explosive head and the propulsion unit,

D. said rocket propulsion unit comprising

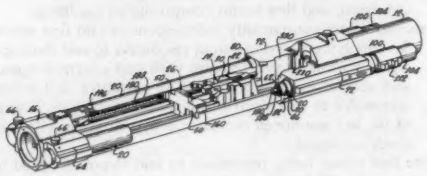
1. a propulsive charge,
2. a tuyere at the after end of the propulsion unit,
3. an inner sleeve loaded with said propulsive charge and made of a coiled fiber and resin structure, there being a wide pitch angle between adjacent fiber coils and
4. an external structure made of a coiled fiber and resin structure, the coils of which are coiled directly on said inner sleeve and extend over said fuse and said tuyere.

4,227,439

ANTI-BOUNCE APPARATUS FOR RECIPROCATING BOLT ASSEMBLIES OF AUTOMATIC CANNON

Richard R. Gillum, Marblehead, Ohio, assignor to Ares, Inc., Port Clinton, Ohio

Filed Mar. 27, 1979, Ser. No. 24,188
Int. Cl.³ F41D 5/04
U.S. Cl. 89—190 **12 Claims**



10. For an automatic cannon having a breech and a bolt assembly mounted for axially reciprocating movement to and from the breech, the bolt assembly including a bolt and a bolt carrier mounted thereto for relative axial movement therewith, bolt assembly anti-bounce apparatus, which comprises:

bolt-to-breech locking means including at least one locking lug pivotally mounted to the bolt, means defining a corresponding recess in the breech for receiving a locking portion of the locking lug, means defining portions of the bolt carrier for engaging corresponding portions of the locking lug to cam the locking portions thereof outwardly into the breech recess in response to continued forward movement of the bolt carrier after the bolt has impacted the breech, and means defining mating engagement surfaces on said bolt carrier and locking lug portions, said engagement surfaces being shaped to cause said bolt carrier and locking lug to maintain engagement during said camming outwardly of the locking portions;

a member connected to the bolt carrier for reciprocating movement therewith;

frictional locking means disposed, when the bolt carrier is proximate to the breech, between said member and portions of the cannon fixed to the breech; and,

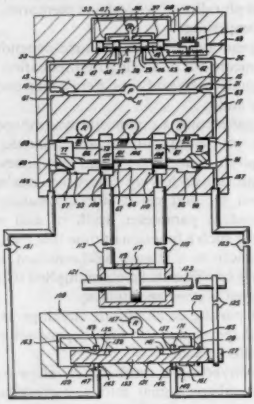
inertial means, responsive to forward impact by the bolt carrier with the breech, for causing the frictional locking means to instantaneously lock said member to said portions of the cannon fixed to the breech.

4,227,440

FLUIDIC REPEATER

Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

Continuation-in-part of Ser. No. 772,560, Feb. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 622,760, Oct. 15, 1975, Pat. No. 4,094,229, which is a continuation-in-part of Ser. No. 521,036, Nov. 11, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Aug. 26, 1977, Ser. No. 828,045
Int. Cl.² F15B 13/16
U.S. Cl. 91—51 **30 Claims**



1. A fluidic repeater system comprising:

transmitter means,

receiver means,

connector conduit means including first and second conduit means,

said first conduit means connecting said transmitter means to said receiver means, said first conduit means including two high pressure conduits,

source means for supplying fluid under pressure to said first conduit means, said source means including for each said high pressure conduit a fluid supply passage having an inlet and an outlet with a restriction therebetween whereby when said inlet is connected to a source of pressure fluid said outlet will provide a fluid supply having a drooping pressure versus rate of flow characteristic, said outlets being connected to the high pressure conduits;

said receiver means including load means and load feedback means,

said load means including responder means for producing mechanical movement and including a piston in cylinder connected to each said high pressure conduit for relative axial movement of the piston and cylinder in response to variation in the pressure in one of said high pressure conduits;

reservoir means including a reservoir of fluid at a lower pressure than said source,

said second conduit means interconnecting said reservoir means with said transmitter means and said receiver means, said second conduit means constituting low pressure conduit means,

said transmitter means serving for venting at least one of said high pressure conduits to said low pressure conduit means in accordance with the position of the transmitter means, thereby to vary the pressure in said high pressure conduit,

said transmitter being positionable over a range of positions including a first position of maximum venting and various positions in between said first and second positions to produce different amounts of movement of the responder means for each of the several positions of the transmitter means within said range of positions,

said load feedback means being responsive to movement of said load means for venting at least one of said high pressure conduits to said low pressure conduit means, and

fluid resistance means in said connector conduit means for balancing

(i) the fluid resistance between said source means and said reservoir means along a transmitter path extending through said transmitter means, excluding the resistance of said transmitter means, with

(ii) the fluid resistance between said source means and said reservoir means along a feedback path extending through said load feedback means, excluding the resistance of said load feedback means,

such that such fluid resistance along said transmitter path is approximately equal to such fluid resistance along said feedback path.

4,227,441

HYDRAULIC SERVO-MOTOR FOR A REGULATING VALVE HAVING A HYDRAULIC CLOSING MECHANISM

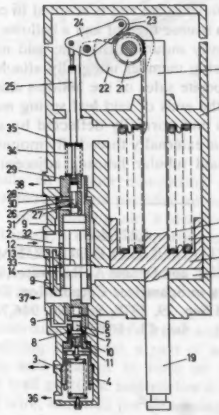
Kamil Prochazka, Windisch, and Franz Suter, Gebenstorf, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 29, 1978, Ser. No. 946,738

Claims priority, application Switzerland, Sep. 29, 1977, 11899/77

Int. Cl.³ F15B *9/10, 13/16*

U.S. Cl. 91—374 **14 Claims**



1. A valve actuator comprising:

servo-motor means

a housing;

control valve means, contained within said housing, for selectively placing said servo-motor means in fluid communication with a source of fluid under pressure and with a drain;

cam means responsive to movement of said servo-motor means for closing said control valve means;

said control valve means including a valve sleeve, which valve sleeve is movable with respect to said housing; and

said control valve means further including a regulating valve slideably arranged within said valve sleeve and movable with respect to said housing, movement of said regulating valve being responsive to movement of said cam means and movement of said valve sleeve being responsive to movement of said regulating valve, said valve sleeve being movable to close said control valve means.

4,227,442

CYLINDER CONTROL DEVICE OF HYDRAULIC CYLINDER APPARATUS

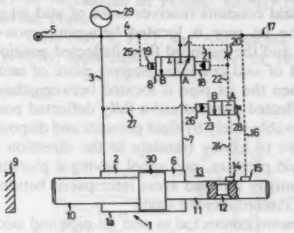
Hiroshi Oguni, Akashi; Masahiro Ishiko, Miki, and Kazuyoshi Nakayama, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jul. 25, 1979, Ser. No. 60,541

Claims priority, application Japan, Jul. 29, 1978, 53-93009

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—392 **10 Claims**



1. A cylinder control device of a hydraulic cylinder apparatus comprising a cylinder body, a piston arranged in said cylinder body for reciprocatory movement, a plurality of working fluid chambers defined by the cylinder body and the piston, a working fluid source, and a plurality of conduits for supplying working fluid from the working fluid source to the working fluid chambers and discharging working fluid therefrom to a fluid discharging place of a working fluid circuit, the cylinder control device comprising:

a two-position, directional control valve operation to control the supply of working fluid to the working fluid chambers and the discharge of working fluid therefrom to thereby switch the movement of the piston from one direction to the other direction, the two-position, directional control valve having a pilot chamber containing working fluid therein for moving the two-position, directional control valve between two positions when a change occurs in the pressure of working fluid in the pilot chamber which is connected to the fluid discharging place of the working fluid circuit; and

a control valve connected to the pilot chamber of said two-position, directional control valve and movable between two positions or open and closed positions for causing the pressure in the pilot chamber to vary, the control valve being moved between the closed position and the open position by a change in the pressure in the conduit in communication with the working fluid source, and the pressure in the conduit in communication with the working fluid source being raised when the piston is in one end position to move the control valve from one position to the other position, thereby causing the pressure in the pilot chamber to vary and moving the two-position, directional control valve from one position to the other position.

4,227,443

FAIL-FIXED SERVOVALVE

Peter D. Toot, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 25, 1978, Ser. No. 945,165

Int. Cl.³ F16B *13/044*

U.S. Cl. 91—459 **8 Claims**

1. A servovalve system comprising:

a sleeve having a plurality of ports therethrough, one of said ports receiving an inlet flow of pressurized fluid, at least one of said ports communicating pressurized fluid to a relatively lower pressure sump, and at least two of said ports comprising separate output ports;

a jet pipe for discharging a jet of pressurized fluid received from said inlet port;

means for producing an electrical input signal having rated input current values from zero to a maximum rated value;

deflecting means responsive to said electrical input signal for deflecting the jet pipe;

a pair of receiver conduits in flow communication with opposite ends of the sleeve and disposed to receive fluid discharged from the jet pipe, wherein:

said conduits receive equal amounts of said jet pipe fluid when the jet pipe is in a balanced flow deflected position,

a first of said conduits receives more of said jet pipe fluid when the jet pipe is located between a non-deflected position and the balanced flow deflected position, and

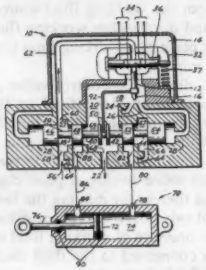
the second of said conduits receives more of said jet pipe fluid when the jet pipe is located between the balanced flow deflected position and a fully deflected position;

a spool movable solely by fluid pressure and disposed within the sleeve to axially translate in the direction of lower sleeve end pressure, said spool having a plurality of circumferentially relieved areas interspaced between a plurality of circumferential lands;

feedback means connected to said jet pipe and said spool;

a servopiston unit having a piston translatably disposed within a bore, each side of said piston respectively being in fluid communication with one of said two separate output ports in said sleeve; and

passage means, formed by the translation of the spool within



the sleeve causing selected relieved areas to interconnect selected sleeve ports with said two output ports for:

delivering pressurized fluid to a first side of the piston and porting pressurized fluid away from the second side of the piston when the spool translates between a position near a first end of the sleeve and the midpoint of its axial stroke within the sleeve;

delivering pressurized fluid to the second side of the piston and porting pressurized fluid away from the first side of the piston when the spool translates between a position near the second end of the sleeve and the midpoint of its axial stroke within the sleeve; and

delivering no pressurized fluid to and porting no pressurized fluid away from the servopiston unit to lock the unit in place when the spool is located near either end of the sleeve at a respective one of a first and second extreme position or is at the midpoint of its axial stroke within the sleeve;

wherein:

when no electrical input signal is applied to the deflecting means the jet pipe is in said non deflected position and the spool is at the first extreme position within the sleeve;

when an electrical input signal is applied to the deflecting means the jet pipe is in a proportionally deflected position and the spool moves proportionally from the first extreme position toward the second extreme position as the magnitude of the electrical signal is increased; and

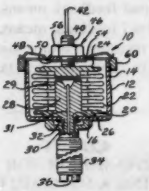
when a maximum rated electrical input signal is applied to the deflecting means the jet pipe is in said fully deflected position and the spool is at the second extreme position.

4,227,444

ANEROID BELLOWS ASSEMBLY

Thomas N. Lincicome, Elgin, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 30, 1978, Ser. No. 956,112
Int. Cl.³ F01B *19/00*; F16J *3/04*
U.S. Cl. 92—40 **3 Claims**



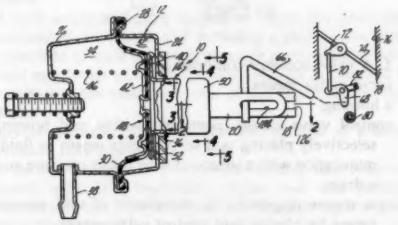
1. An aneroid bellows assembly for use in automatically controlling the flow of emergency oxygen in an aircraft cabin when pressurization is lost at varying altitudes comprising an open ended tubular housing member having a hermetically sealed, evacuated bellows spring mounted therein; said bellows having a threaded adjustment member integrally attached thereto and extending axially thereof beyond the open end of said housing member, said adjustment member having a tip portion on its outer end which is adapted to move axially with variations in cabin pressure and is adapted to control the flow of oxygen from a source thereof and a bellows adjustment nut assembly threadedly mounted thereon; said nut assembly including a leaf spring member integrally attached thereto and extending on opposite sides of the bellows axis and generally normal thereto, the ends of said leaf spring member being in engagement with and normally deflected by a spring adjustment ring which is externally threadedly mounted on the open end portion of said tubular housing adjacent the open end thereof.

4,227,445

MOTOR WITH MULTIPLE OUTPUT MEMBERS

Charles A. Detweiler, and Dennis A. Rainwater, both of Durand, Mich., assignors to Schmelzer Corporation, Durand, Mich.

Filed Sep. 29, 1978, Ser. No. 946,747
Int. Cl.³ F16J *1/10*
U.S. Cl. 92—84 **4 Claims**



1. A fluid pressure motor comprising a housing, a movable wall in said housing forming chambers at opposite sides and being movable in response to differential pressure at opposite sides of said wall, means for varying the pressures in said chambers to create said differential pressure, an output assembly having a carriage member connected to said wall and a plurality of output members movably supported relative to said carriage member, all of said output members being mounted with their axes parallel and movable in one direction

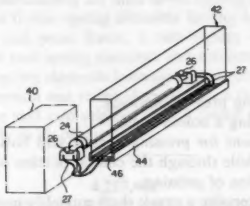
during movement of said wall from a first to a second position, a first biasing means resisting movement of a first output member in one direction relative to said carriage, and a second biasing means resisting movement of a second output member in said one direction relative to said carriage and assiting movement of said first output member in the opposite direction relative to said carriage, a third output member, said third output member being connected to said carriage member for movement with said wall as a unit, a seat member mounted in carriage member and engaged by said first and second biasing means, each of said first and second output members having a lost motion connection with said seat member permitting movement of said output members relative to said wall, the third output member being connected to said seat member.

4,227,446

ELECTRONIC AIR CLEANER FOR PASSENGER COMPARTMENT OF VEHICLE

Masazumi Sone, Yokohama; Kazuhiko Suzuki, Yokosuka, and Yukitsugu Fukumori, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 10, 1979, Ser. No. 28,867
Claims priority, application Japan, May 30, 1978, 53/72352
Int. Cl.³ B60H *3/06*; B03C *3/01, 3/32*
U.S. Cl. 98—2.11 **6 Claims**



1. An electronic air cleaner comprising an electrostatic precipitator for removing dust particles suspended in air, an ultraviolet lamp for sterilizing air, a deodorizing filter for eliminating smell in air, a holder supporting said deodorizing filter and at least one lead wire extending along said deodorizing filter from an electric power source to said ultraviolet lamp, said lead wire having a tendency to radiate electrical noise,

wherein said deodorizing filter has a frame and said holder has wall portions defining a channel, a part of said frame being snugly seated in said channel to form an enclosed space bounded by said wall portions, said enclosed space receiving therein said lead wire, said wall portions being constructed of electrically grounded conductive material to conduct to ground electrical noise.

5. In a vehicle having an electric device sensitive to electric noise and having an electric air cleaner for cleaning air in a passenger compartment, said cleaner being positioned close to the electrically sensitive device and comprising an electrostatic precipitator for removing fine dust particles suspended in the air, said precipitator including electrically insulated first and second groups of electrodes between which a high electric potential is applied; an ultraviolet lamp for sterilizing the air; a deodorizing filter for eliminating smell in air; a holder by which said deodorizing filter is supported; and at least one lead wire which extends along said deodorizing filter from an electric power source to said ultraviolet lamp for providing said lamp with electric power, said lead wire having a tendency to radiate electrical noise;

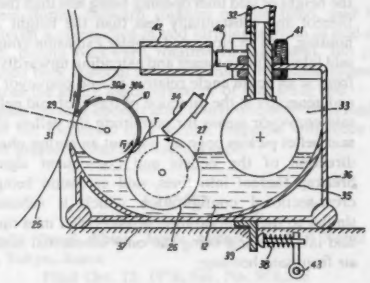
an improvement for reducing the effect of electrical noise generated by said lead wire, wherein said deodorizing filter has a frame and said holder has wall portions defining a channel, a part of said frame being snugly seated in said channel to form an enclosed space bounded by said wall portions, said enclosed space receiving therein said lead wire, and said wall portions being constructed of an electrically conductive material to conduct to ground electrical noise generated by said lead wire.

4,227,447

MACHINE FOR MANUFACTURING PANCAKES OR SIMILAR PRODUCTS

Jean A. L. Bronnec, Brest, France, assignor to Etablissements Generaux de Mecanique de l'Ouest EGMO (Societe Anonyme), Brest, France

Filed Nov. 8, 1977, Ser. No. 849,566
Claims priority, application France, Nov. 10, 1976, 76 33927
Int. Cl.³ A47J *37/10*
U.S. Cl. 99—423 **7 Claims**



1. Machine for manufacturing pancakes or other products obtained by baking or heating a paste spread thinly in a given configuration. comprising a smooth and continuous baking surface, a paste tank, a spreader constituted by a cylinder with a smooth surface dipping into said paste tank at a substantially constant level, two close generators situated respectively on the baking surface and on the spreader and called transfer generators, said spreader being arranged to transport and to transfer the paste onto the baking surface at the level of said close generators, said baking surface and said spreader being actuated in relative movement, a flap obturator arranged in the immediate vicinity of the generator of the spreader situated at the level of the surface of the paste on the emergence side, and called extraction generator, eliminating the contact necessary for the drawing of the paste by the spreader at certain points of the generator, said obturator being arranged so that for each of its relative positions, these points vary along the extraction generator and being driven in to and fro movement, and wherein the obturator is constituted by a flap concentric with the spreader, laying on it with gentle rubbing, having a cut-out or channel corresponding to half of the shape of the pellicle to be transferred to the baking surface and mounted to rock around the axis of rotation of the spreader in a movement connected to the speed of the baking surface and whose amplitude corresponds at least to the depth of the cut-out.

4,227,448

PELLET PRE-COOLER FOR PELLET MILL

Richard L. Ronning, Overland Park, Kans., assignor to Ronning Engineering Company, Inc., Overland Park, Kans.

Filed Jun. 7, 1978, Ser. No. 915,070
Int. Cl.³ A23K *1/14, 1/20*; A23N *17/00*; A23B *4/06*
U.S. Cl. 99—489 **1 Claim**

1. A mill system for processing crops, comprising:

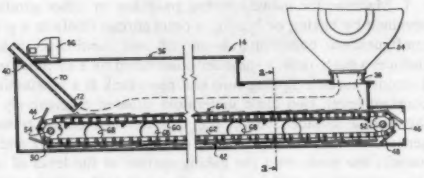
a pelletizing machine for receiving comminuted crops and producing pellets therefrom; and

pellet cooling and conveying means operably coupled to said machine for receiving said pellets therefrom, said cooling and conveying means including

a precooler having a hot pellet inlet operably coupled to

said pelletizing machine, a pellet outlet spaced from said inlet, generally horizontal conveyor means for gently transporting pellets from said inlet to said outlet without significant breakage and erosion of the pellets, a housing substantially enclosing said conveyor means for defining a precooling chamber, structure de-structure defining at least one air inlet proximal to said conveyor means and communicating the interior of said chamber with a source of air, and means for dispersing air from said source in proximity to said pellets on said conveyor means,

said pickup structure having means defining an elongated, pellet inlet opening above and closely adjacent to said conveyor means and extending transversely across substantially the full width of said conveyor means with the height of said inlet opening being less than the width thereof and substantially less than the height of said housing, and an elongated tubular extension coupled to said inlet-defining means and extending upwardly therefrom at an acute angle relative to said conveyor means and generally in the direction of travel of said pellets on said conveyor means for permitting the pellets to enter said pellet pickup opening without an abrupt change of direction of the pellets and consequent significant breakup thereof into fines, said extension being of a cross-sectional configuration which is substantially similar to the configuration of said pellet inlet opening, said inlet opening being the only substantial outlet for air from said housing;



a primary cooler for additional cooling of pre-cooled pellets from said precooler;

conduit means operably coupling and communicating said primary cooler and the end of said extension remote from said pellet inlet opening;

air-moving structure operably associated with said pellet cooling and conveying means, including fan means in communication with said conduit for drawing air through said air inlet and creating a negative pressure airflow through said housing, pellet inlet opening, extension and conduit, for moving air currents from said source thereof through said air inlet, into and through said chamber for dispersal of the air by said air-dispersal means, out of said chamber through said pellet inlet opening and extension, and through said conduit means to said primary cooler, such that:

(a) the air currents cooperatively created and dispersed by said structure and air dispersal means gently precool said initially hot pellets on said conveyor means without significant deterioration thereof into fines; and

(b) said air currents at the region of said pellet inlet opening have increased velocity by virtue of the airflow restriction presented by the pellet inlet opening for pneumatically conveying said pellets out of said chamber through said pellet inlet opening and upwardly through said extension to said primary cooler through said conduit means for rapid final cooling of the pellets in said primary cooler.

4,227,449

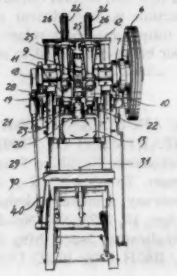
PUNCHING PRESS

Leu C. Ping, No. 74, Jong Shiaw Rd., Baan Chyau, Taiwan

Filed Apr. 30, 1979, Ser. No. 34,396

Int. Cl.³ B30B *1/26, 15/32*

U.S. Cl. 100—98 R **3 Claims**



1. A punching press comprising:

a frame having a bolster plate;

a slide element for pressing against said bolster plate and having a hole through the central portion of said slide in the direction of pressing;

a crank comprising a crank shaft rotatably mounted to said frame above the bolster plate and slide, said crank further comprising a crank pin carried upon two crank arms, said arms having identical planar profiles in the plane perpendicular to said crankshaft and having circumferential bearing surfaces;

a flywheel and clutch assembly mounted at one end of said crank shaft;

a cam attached to the end of said crankshaft which is opposite said flywheel and clutch assembly;

lever means movably mounted on said frame and actuated by said cam to eject finished work;

two pressure rods, said rods having bearing means at an upper end, the lower ends of said rods being attached to said slide with one rod on each side of said hole in the slide;

spring means, attached between the upper ends of said pressure rods and the frame, said spring means providing resilient bias of the rods and slide to an upward position, and resiliently retaining said rods and said slides in said upward position;

a punching ram slidingly movable within the hole in the slide; and

a connecting rod mounted on said crank pin and pivotally connected to said punching ram, said two pressure rods being spaced on each side of the connecting rod with the upper bearing ends of said rods in contact with the circumferential bearing surfaces on the respective crank arms, whereby rotation of said crank shaft causes the crank arms to force the pressure rods downward, thereby forcing said slide against said bolster plate so as to provide a pressing stroke, said crank pin being located within the profile of said crank arms to provide a punching stroke for said connecting rod and said ram, whereby both pressing and punching strokes are provided during one rotation of said crank shaft.

4,227,450

PRESS WITH SMALL RAM STROKE

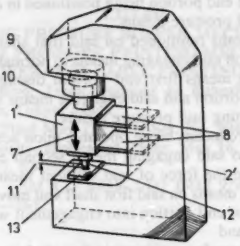
Heinz Kreiskorte, Dortmund, Fed. Rep. of Germany, assignor to Thyssen Industrie AG, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,515

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2805013

Int. Cl.³ B30B *15/04*

U.S. Cl. 100—214 **10 Claims**



7. A press having a short ram stroke in which the ram is movable in a single plane in a working direction and in a return direction and particularly for high speed cutting presses, comprising, a press frame, spring elements having an end rigidly connected to said press frame, a ram rigidly connected to another end of said spring elements and resiliently supported solely by said spring elements from said frame for movement in a working direction and return direction such that said spring elements guide said ram relative to said frame while holding said ram rigidly in all other planes.

4,227,451

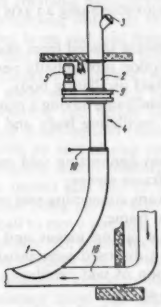
DEVICE FOR DELIVERY OF BULK MATERIALS

Valentin N. Slavinsky, prospekt Shvernika, 10, kv. 101, Leningrad; Genrikh V. Bairon, ulitsa Proletarskaya, 131, kv. 77, Leningrad, Kolpino; Adolf M. Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8, Moscow; Gennady M. Alexeev, Sredny prospekt, 61, kv. 55, Leningrad; Alexandr F. Savenok, ulitsa Kurlyandskaya, 38, kv. 15, Leningrad; Vladimir M. Matveev, Staro-Orlovskaya ulitsa, 35, kv. 1, Leningrad; Fedor E. Elin, V.O., 5 linia, 4, kv. 45, Leningrad; Gennady B. Provalsky, ulitsa Gastello, 10, kv. 31, Leningrad; Boris P. Shulbakh, ulitsa Dekskaya, 62, korpus 3, kv. 18, Leningrad, and Jury A. Tsimbler, Sojuzny prospekt, 10, kv. 26, Moscow, all of U.S.S.R.

Filed Nov. 6, 1978, Ser. No. 958,171

Int. Cl.³ B30B *11/00*

U.S. Cl. 100—295 **7 Claims**



1. A device for the delivery of bulk material into a suction pipe of a pneumatic transport installation comprising:

a charging pipe into which said bulk material is introduced;

a closing element positioned between said charging pipe and said suction pipe and comprising a cylindrical shell, an inside diameter of said shell being approximately equal to an inside diameter of said charging pipe;

a gate valve positioned between said shell and said suction pipe;

a sleeve rotatably and coaxially built in said shell, an inside diameter of said sleeve being approximately equal to said inside diameter of said shell;

a reversible drive kinematically linked with said sleeve for rotation of said sleeve; and

a helical band having a first end rigidly connected to said sleeve and being positioned in an upper portion of said shell, said band being mounted for joint rotation with said sleeve, a forming portion of said shell being defined in a portion of said shell under said band;

wherein during forward rotation of said band, said bulk material is compacted in said forming portion of said shell and, during backward rotation of said band, the compacted bulk material is formed into a briquette extending across the entire inside diameter of said shell; and

said gate valve is opened after a first briquette is formed, so that the formation of a second briquette will force said first briquette into said suction pipe.

4,227,452

PRINTING MACHINE

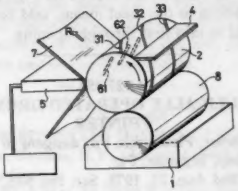
Masayoshi Tamai, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,205

Claims priority, application Japan, Oct. 14, 1977, 52-122317; Oct. 14, 1977, 52-122319; Oct. 14, 1977, 52-122320

Int. Cl.³ B41F *9/00*; G02B *5/30*

U.S. Cl. 101—1 **20 Claims**



1. A printing machine comprising; a supply of ink, a cylindrical applicator, a spiral groove formed on the peripheral surface of said applicator in a manner to define a helix around its axis; a doctor blade for maintaining a predetermined amount of ink in the groove of said applicator and for removing excess ink from the applicator; electrode means including a plurality of electrodes disposed opposite to the groove of said applicator; means for feeding recording paper at a speed related to the rotating peripheral speed of said applicator between said applicator and the electrode means; and, wherein the voltage responsive to the character signal is sequentially applied to the electrode means to thereby contact the ink in the groove with the recording paper to print the character.

4,227,453

IMPRINTING OF TIME CLOCK DATA

Andrew M. McInnis, Covina, Calif., assignor to DBS, Inc., Randolph, Mass.

Filed Jun. 19, 1978, Ser. No. 916,599

Int. Cl.² B41F *3/02*

U.S. Cl. 101—45 **14 Claims**

1. Apparatus for imprinting time clock data on sheet means, comprising

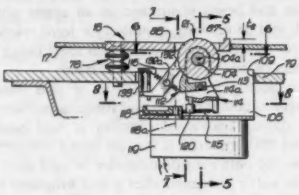
(a) first means providing time data in indicia form for presentation toward the sheet means, said first means including

wheels carrying the indicia, and shaft structure supporting the wheels,

(b) control means operatively connected with said first means to automatically and periodically change the indicia presented toward the sheet means,

(c) and imprinting structure including a roller mounted for progressive advancement at selected times over the sheet means to urge the sheet means toward the time data indicia which are presented toward the sheet at the selected times,

(d) there being a base plate defining a first through opening, a platen to receive the sheet means, said platen having



means for presenting further imprint indicia toward the sheet means, the platen overlying the base plate, the platen defining a second through opening, the platen yieldably connected to the base plate, for movement relative to the base plate in response to roller pressure exertion on said further imprint indicia via the sheet means,

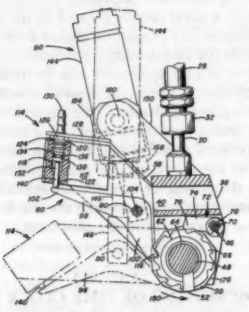
(e) there being means yieldably connecting the shaft structure and wheels to the platen to move with the platen and further to move relative to the platen in response to roller pressure exertion onto the wheels via the sheet means, said wheels projecting in said second through opening to present the indicia to the sheet means, said connecting means positioned in said first through opening.

4,227,454

HYDRAULICALLY OPERATED DRUM SERIES PRINTER

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham, Company, Ingomar, Pa.

Filed Aug. 22, 1978, Ser. No. 935,773
Int. Cl.³ B41J 7/78
U.S. Cl. 101—93.01 **13 Claims**



1. Marking apparatus comprising,

a marking head,

a wheel rotatably supported by said marking head,

said wheel having a periphery with a plurality of marking characters positioned thereon,

a ratchet portion on said wheel,

a first shaft positioned adjacent said wheel,

engaging means rotatably positioned on said first shaft for engaging said ratchet portion,

said engaging means having a first end portion and a second end portion,

said first end portion being movable upon rotation of said engaging means on said first shaft into and out of engagement with said ratchet portion,

pressure means for moving said engaging means into engagement with said ratchet portion,

said second end portion being positioned in abutting relation with said pressure means,

resilient means positioned on said first shaft for exerting a force upon said engaging means to normally maintain said engaging means first end portion disengaged from said ratchet portion and said engaging means second end portion abutting said pressure means,

said pressure means being operable upon actuation to apply a force to said engaging means second end portion and overcome the force of said resilient means to pivot said engaging means on said first shaft and move said engaging means first end portion into engagement with said ratchet portion, and

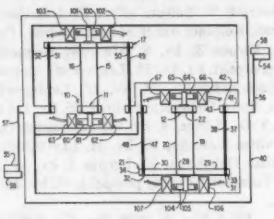
actuator means for moving said first shaft in an arcuate path through a preselected angle so that said engaging means moves through a corresponding angle to rotate said wheel in a preselected direction through an angle corresponding to the angle of movement of said engaging means and thereby advance said marking characters on said wheel.

4,227,455

SUSPENSION ARRANGEMENT FOR AN OSCILLATING BODY

William B. Pennebaker, Carmel, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,593
Int. Cl.³ B41J 7/70
U.S. Cl. 101—93.05 **11 Claims**



1. A suspension arrangement including:

an oscillating body movable along an axis at a selected resonant frequency;

intermediate frame means spaced from said oscillating body in at least one direction substantially perpendicular to the axis of motion of said oscillating body;

a main frame, said main frame having a mass greater than the total mass of said oscillating body and said intermediate frame means;

first leaf spring means connecting said oscillating body to said intermediate frame means;

second leaf spring means connecting said intermediate frame means to said main frame;

each of said first leaf spring means and said second leaf spring means being disposed substantially perpendicular to the axis of motion of said oscillating body when said oscillating body is at rest;

said first leaf spring means having a larger spring constant than said second leaf spring means;

said first leaf spring means and said second leaf spring means having substantially the same degree of flex to cancel any displacements other than said oscillating body along its

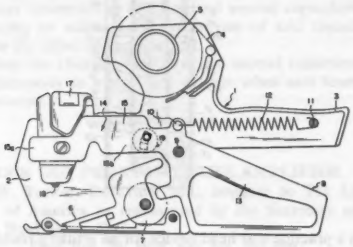
axis of motion so that said oscillating body has spatially linear motion along its axis of motion;
means to compensate for lost energy during movement of said oscillating body along its axis of motion;
support means to support said main frame, said main frame having vibrations relative to said support means;
and means to substantially prevent transmission of vibrations from said main frame to said support means.

4,227,456

PRINTING PRESSURE BUFFER MECHANISM OR CONSTANT PRESSURE PRINTING MECHANISM FOR HAND-OPERATED LABEL PRINTING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,758
Claims priority, application Japan, May 16, 1977, 52-055287; May 16, 1977, 52-055288
Int. Cl.[3] B41K *5/00*; B41J *9/42*
U.S. Cl. 101—291 **19 Claims**



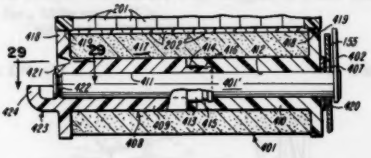
1. A label printing machine, comprising:
a machine frame; a printing platen supported on said machine frame;
a printing lever movably supported to said frame; a printing head on said printing lever and movable with said printing lever; said printing head having types opposable to said platen; said printing lever, with said printing head, being movable from a released position, with said printing head away from said platen, to a printing position with said printing head in engagement with said platen;
engaging means on one of said printing lever and said frame; said engaging means comprising a recess located in the one of said printing lever and said frame that carries said engaging means; said engaging means also comprising a rotatable ball which is movable into and out of said recess along a pathway across the direction of motion of said printing head toward said platen; biasing means normally biasing said rotatable ball out of said recess;
a shoulder projecting out from the surface of the other of said printing lever and said frame and projecting toward the one of said printing lever and said frame on which said engaging means is positioned; said shoulder being placed such that upon said printing head moving toward said printing position, and before said printing head reaches said printing position, said rotatable ball, then biased out of said recess by said biasing means, abuts said shoulder, and said biasing means inhibits said rotatable ball from shifting to permit said ball to bypass said shoulder; said rotatable ball being moved into said recess to permit said rotatable ball to move past said shoulder, whereby shifting of said rotatable ball in said recess is under the influence of both of said shoulder and said biasing means; said rotatable ball being rotatable as said rotatable ball engages the other of said printing lever and said frame from which said shoulder projects as said printing lever and said frame move past one another;
upon sufficient force being applied to move said printing lever to said printing position, said rotatable ball and said shoulder passing one another, and said printing lever and said printing head thereafter being free to move said printing head to said printing position.

4,227,457

INKING MECHANISM

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 476,744, Jun. 5, 1974, Pat. No. 3,957,562, which is a continuation-in-part of Ser. No. 380,445, Jul. 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 312,454, Dec. 6, 1972, Pat. No. 3,968,745, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Feb. 17. 1976, Ser. No. 658,191
The portion of the term of this patent subsequent to Aug. 17, 1990, has been disclaimed.
Int. Cl.[2] B41F *1/46*
U.S. Cl. 101—348 **12 Claims**



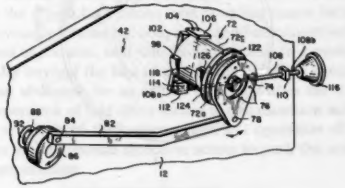
1. An ink roll, comprising: a hub consisting of two and only two pieces, a porous ink-receptive roll received on the hub, the hub having an axial through-hole adapted to receive a shaft with an annular groove, the hub having a flexible resilient finger extending into the through-hole and adapted to extend into the groove in the shaft, and an extension disposed at the exterior of the hub adjacent and spaced from the flexible resilient finger, secured to one end of the hub, and extending beyond the open end of the through-hole.

4,227,458

INK FOUNTAIN DRIVE MECHANISM

Vinod Kapoor, Bayside, N.Y., assignor to Butler Greenwich Inc., Greenwich, Conn.

Filed May 30, 1978, Ser. No. 910,815
Int. Cl.[3] B41F *31/04, 31/06*
U.S. Cl. 101—350 **12 Claims**



1. In an ink fountain of the type having a rotatively mounted fountain roller, a roller drive mechanism comprising:
A. a wrap spring overrunning clutch having an input drum, an output drum, a concentric sleeve encircling both drums, and a coil spring grippingly encircling the drums within the sleeve, said spring having its end adjacent the input drum secured to the sleeve,
B. means for connecting the roller for rotation with the output drum,
C. means for oscillating the clutch input drum through a selected angle, the oscillating input drum movement in one direction causing tightening of said spring about the input and output drums right at the start of each oscilla-

tion whereby the clutch output drum and sleeve, as well as the fountain roller are rotated in said direction commencing right at the start of each oscillation,

D. means for positively stopping the rotation of the clutch sleeve after the sleeve has rotated through a desired stroke angle so as to loosen the spring windup and thereby decouple the input and output drums and thereby terminate the angular advance of the output drum and the fountain roller in said direction while said input drum completes its rotation through said selected angle, and

E. coacting means on the clutch input drum and sleeve for positively rotating the sleeve in the opposite direction back to its initial position at the start of each said oscillation.

4,227,459

TRANSFER DRUM FOR SHEET-FED ROTARY PRINTING PRESSES

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

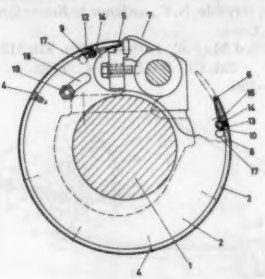
Continuation of Ser. No. 704,638, Jul. 12, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,370

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1975, 2530951

The portion of the term of this patent subsequent to Jan. 25, 1994, has been disclaimed.

Int. Cl.³ B41F *21/04, 27/12, 29/04, 7/22*

U.S. Cl. 101—415.1 **1 Claim**



1. Transfer drum for a sheet-fed rotary printing press comprising a pair of spaced support discs mountable on a shaft of the printing press, a drum shell peripherally secured to said support discs and having an outer surface, a blanket reinforced with fabric plies and tautly covering said outer surface, said fabric plies being subjected to tensile force acting in a given direction, said blanket having two ends, means for securing the ends of said blanket to said drum shell, said fabric plies being elastic in said given direction of action of said tension force, said support discs being formed with slots extending in peripheral direction thereof, and including threaded fastening means extending through said slots for adjustably clamping said support discs to the shaft of the printing press.

4,227,460

PRACTICE WAR HEAD DEVICE

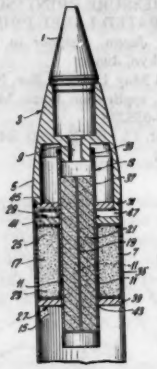
Hartmut Krone, Auggen; Rüdiger van Acken, Müllheim; Wolfgang Trede, Weil am Rhein, and Robert Schmidlin, Neuenburg, all of Fed. Rep. of Germany, assignors to Buck Chemisch-Technische Werke GmbH & Co., Bad Reichenhall, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,297

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1977, 2733700

Int. Cl.³ F42B *13/14, 13/44*

U.S. Cl. 102—66 **16 Claims**



1. In a practice war head device for an artillery rocket composed of a frusto-conical head element having a hollow nose section and a hollow skirt section having a base, an impact detonator mounted in said nose section, a tubular jacket connected to the skirt section, a tubular dividing element concentric with the tubular jacket together defining an annular volume, a fog producing substance based on a carbon halogen or halogen carbohydrate substance and reactive metal or metal oxide powders in said annular volume, and an ignition core of a quick-reacting ignition substance capable of high gas formation in the tubular dividing element, the improvement which comprises said fog producing substance being loosely packed in the annular volume, and wherein closure elements closing off said annular volume are provided at the nose side and base side of the annular packing, at least the nose side closure element is displaceable towards the fog producing substance packing, and the connection between the skirt section of the head element and the tubular jacket, the connection between the central portion of the head element and the tubular dividing element, and the base of the skirt section, are constructed so that upon impact of the war head device, the base of the skirt section and nose side closure element will be displaced into the annular volume to thereby compress the fog producing substance against the base side closure element.

4,227,461

DUAL OUTPUT SIMULTANEOUS FIRING CIRCUIT

Dale L. Beezley, Sunnyvale, and Wolf Goodman, Mountain View, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 8, 1978, Ser. No. 941,092

Int. Cl.³ F42C *11/00*

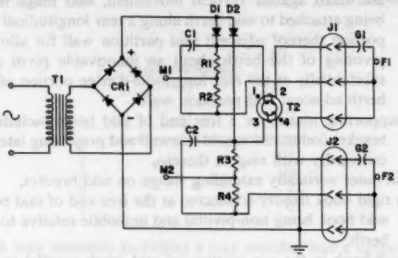
U.S. Cl. 102—218 **7 Claims**

1. A dual output simultaneous firing circuit comprising:

(a) a first capacitor connected in parallel to a first fuse having a first gap such that when the charge on said first capacitor exceeds the breakdown voltage of said first gap, said first fuse explodes as said first capacitor discharges;

(b) a second capacitor connected in parallel to a second fuse

having a second gap such that when the voltage on said second capacitor exceeds the breakdown voltage of said second gap, said second fuse explodes as said second capacitor discharges;



(c) means connected to said first and second capacitors for inducing an additive voltage to one of said capacitors when the other discharges; and

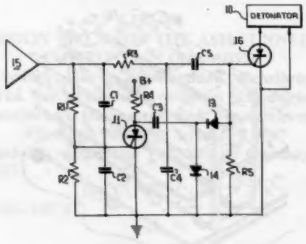
(d) means for charging said first and second capacitors simultaneously to a high DC voltage when said fuses are connected.

4,227,462

LOCK OUT PROXIMITY FUZE AMPLIFIER

Robert W. Tucker, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 28, 1975, Ser. No. 553,359
Int. Cl.³ F42C *11/00*; H03K *5/22, 17/00*
U.S. Cl. 102—220 **10 Claims**



1. A rise time discriminator circuit for detecting an applied input signal having an amplitude envelope which increases to a predetermined level at a rate which is slower than a first specified rate, said discriminator circuit comprising:

an actuable normal electronic switch;

an actuable lock out electronic switch;

a first trigger circuit for said normal electronic switch, said first trigger circuit including first resistive means and first capacitive means connected such that said first capacitive means is charged through said first resistive means by said input signal, said first resistive means and first capacitive means having a time constant which is sufficiently long to cause the charge on said first capacitive means to substantially lag the amplitude envelope of said input signal for signal envelope increase rates faster than said first specified rate;

a second trigger circuit for said lock out electronic switch, said second trigger circuit including second resistive means and second capacitive means connected such that said second capacitive means is charged through said second resistive means by said input signal, said second resistive means and second capacitive means having a time constant which is sufficiently short to permit the charge on said second capacitive means to rapidly follow the amplitude envelope for signal envelope increase rates faster than said first specified rate;

first voltage-dividing bias means responsive to the charge on said first capacitive means reaching said predetermined level for actuating said normal electronic switch;

second voltage-dividing bias means responsive to the charge on said second capacitive means exceeding said predetermined level for actuating said lock out electronic switch; and

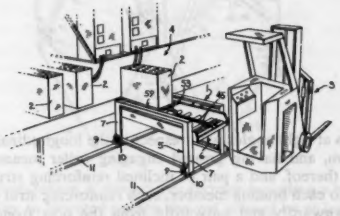
inhibiting means responsive to actuation of said lock out electronic switch for inhibiting actuation of said normal electronic switch.

4,227,463

APPARATUS FOR REMOVING AND INSTALLING BATTERIES

Robert H. Pfleger, Milwaukee, Wis., assignor to Pflow Industries, Inc., Milwaukee, Wis.

Filed Mar. 27, 1978, Ser. No. 890,362
Int. Cl.² B60D *1/14*
U.S. Cl. 104—34 **11 Claims**



1. An apparatus for removing an article from a compartment, comprising a supporting frame, a bed mounted on the frame and having a surface to support the article in longitudinal movement, elevating means for moving the bed vertically relative to the frame to position the bed substantially flush with the bottom of the compartment, chain drive means mounted for movement in a longitudinal direction on the bed, and coupling means including a rigid arm removably connected to the chain drive means and extending longitudinally of the bed, means for mounting the arm for vertical removal from said chain drive means, whereby said arm can be connected at any location on the drive chain means, said coupling means including a downwardly extending coupling member connected to the outer end of the arm, said arm being movable to a position longitudinally beyond the bed to enable the coupling member to engage an abutment on an article located within the compartment, operation of said drive means in one direction acting to pull the article from the compartment and operation of the drive means in the opposite direction acting to push the article into the compartment.

4,227,464

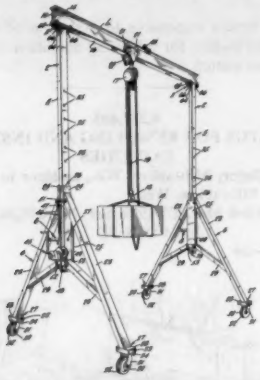
GANTRIES

Bernard E. Wallace, R.D. 1, Box 67A, Valley Hill Rd., Malvern, Pa. 19355

Filed Sep. 22, 1978, Ser. No. 944,733
Int. Cl.³ B66C *5/02*
U.S. Cl. 104—126 **9 Claims**

1. In a portable gantry having a load carrying beam from which a hoisting mechanism is adapted to be suspended, said gantry being adapted to straddle elongated objects; supporting leg structure for said gantry comprising an upright hollow post member of rectangular cross section, the longer axis of the rectangle extending in the direction of the long axis of the beam, fastening means interconnecting the post to the beam

comprising a rigid insert member secured to the post at the upper end thereof and projecting into the end of the post, said insert member having fastening means for connection to the beam, said insert member being dimensioned to brace the interior of the post against bending with respect to the beam, a support means for the post comprising a pair of inclined bracing members extending downwardly and outwardly from the post at points on the post equally displaced upwardly from the bottom of the post, said bracing members lying in a plane



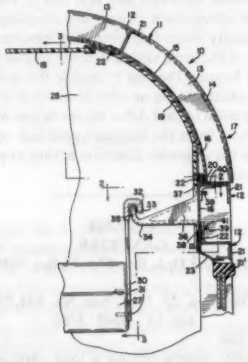
which is at right angles with respect to the longitudinal axis of the beam, and having ground engaging roller means at the bottom thereof, and a pair of inclined reinforcing struts connected to each bracing member, each reinforcing strut extending downwardly and outwardly from the post from points adjacent the bottom of the post to points intermediate the ends of the bracing members, said inclined bracing members and struts providing ground clearance for elongated objects in vertical planes beneath said beam.

4,227,465

UPPER BERTH SUPPORT ARRANGEMENT

Jack E. Gutridge, Dyer, and Walter J. Marulic, Gary, both of Ind., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 28, 1978, Ser. No. 900,830
Int. Cl.[3] B61D *31/00*
U.S. Cl. 105—321 **6 Claims**



1. In a railway sleeping car compartment having a side wall, a ceiling wall and a transversely extending partition wall, the improvement comprising:

an upper berth,

hinge means hingedly connecting said berth to said partition wall for hinging movement between a horizontal use position and an upper diagonal non-use position adjacent said ceiling wall,

said hinge means being fixedly attached to said partition wall and fixed against vertical movement, said hinge means being attached to said berth along a rear longitudinal edge portion thereof adjacent said partition wall for allowing pivoting of the berth about an immovable pivot point substantially at the rear longitudinal edge portion of said berth adjacent said partition wall,

supporting means for a free end of said berth including a bracket connected to said sidewall and projecting laterally outwardly with respect thereto,

an outer vertically extending flange on said bracket,

a rigid hook fixedly connected at the free end of said berth, said hook being non-pivotal and immobile relative to said berth,

said hook in the use position of said berth parallel to said partition wall being substantially/and engaging said flange to support said berth and to provide lateral stability therefor; and

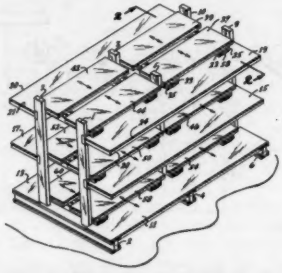
a supporting shelf disposed between said berth and said sidewall when said berth is in said horizontal use position, said shelf having one end supported on said bracket and another end supported on said partition wall.

4,227,466

IN-DEPTH STORAGE DEVICE

Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Co., Beverly Hills, Calif.

Continuation of Ser. No. 815,946, Jul. 15, 1977, abandoned. This application Jul. 31, 1978, Ser. No. 929,283
Int. Cl.[2] A47B *57/00*
U.S. Cl. 108—93 **5 Claims**



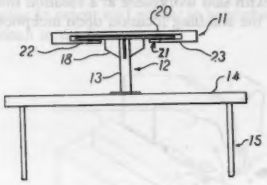
1. An improved warehouse storage device for mechandise having a base, a plurality of vertical support members extending upwardly from said base and being horizontally spaced from one another, a plurality of fixed cantilever mounted horizontal storage shelves affixed to said vertical support members and extending outwardly from said vertical support members such that certain of said fixed horizontal storage shelves affixed to successive vertical support members are horizontally spaced from one another, a plurality of sliding shelves movable along horizontal paths in spaced relationship overlying said fixed shelves and separate guide means mounted between said horizontally spaced fixed storage shelves and spanning substantially only the space therebetween for support and horizontal guiding of said sliding shelves outwardly and inwardly relative to said fixed shelves such that said sliding shelves may be moved to overlie said fixed shelves and loaded with merchandise and thereafter horizontally displaced inwardly to a position over the space between said certain shelves to expose substantially the entire area of said fixed shelves for loading with merchandise.

4,227,467

TRAY ASSEMBLY

Gerald N. Kindsfather, 635 Custer Ave., Billings, Mont. 59101

Filed Mar. 26, 1979, Ser. No. 23,665
Int. Cl.[3] A47B *13/14*
U.S. Cl. 108—101 2 Claims



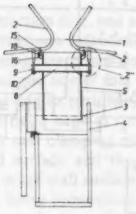
1. A tray assembly including a tray member and a support member; the support member including a spacer portion having one end affixed to a top of a table and extending upwardly therefrom, and a tray supporting portion at the free upper end of said spacer portion including a horizontally disposed generally circular plate section; the tray member including a substantially flat upper tray portion, and a support portion associated with the bottom thereof, said support portion of said tray member including a pair of horizontally disposed guide sections having their adjacent edges spaced an equal distance from the center of said tray member and spaced from the bottom surface of said tray member a distance sufficient to accept said plate between said guide sections and said bottom surface to provide a rigid connection. therebetween with the spacing between the adjacent edges substantially the same along the central portion of said guide sections and with the spacing between the adjacent edges increasing toward the opposite edges of said tray member, said guide sections providing a substantially flat support portion for said tray member.

4,227,468

IMMERSION PIECE FOR THE ASH FUNNEL OF A COMBUSTION CHAMBER

Horst Buchmüller, Hünxe, and Bernhard Michelbrink, Wesel, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jan. 26, 1979, Ser. No. 6,579
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1978, 2830372
Int. Cl.[3] F23J *1/00*
U.S. Cl. 110—165 R 6 Claims



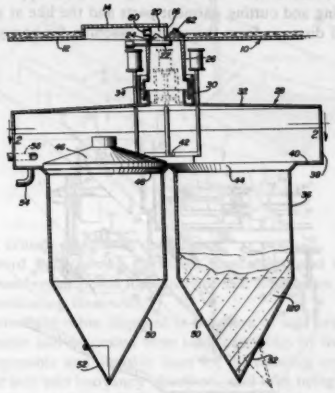
1. An immersion member for an ash funnel forming the bottom part of a steam generator combustion chamber and being formed of tubes, said immersion member protruding into the water level of a trough filled with quenching water and located underneath said ash funnel for receiving ash from the ash funnel; fastening means for connecting said immersion member to said ash funnel, said fastening means comprising; carrier means and screw means connected to said ash funnel, said carrier means being cooled and passing transversely through said immersion member; said carrier means being suspended from the ash funnel by said screw means; and seal means located between said immersion member and said ash funnel and being deformable in vertical direction.

4,227,469

MULTIPURPOSE SLAG SYSTEM

Frank Collura, 2926 W. Jean St., Tampa, Fla. 33614

Filed Aug. 23, 1978, Ser. No. 936,183
Int. Cl.[2] F23J *1/00*
U.S. Cl. 110—171 22 Claims



1. In combination, a wet bottom furnace including a bottom wall having an elevated section thereof defined by at least one upstanding wall portion defining an opening therethrough adjacent said bottom wall and defining a vertical tap hole in front of which granular material may be deposited for damming said vertical tap hole against the flow of molten slag therethrough from the interior of said furnace, said furnace bottom wall including wall means defining a downwardly opening compartment exteriorly of said furnace into which said tap hole opens from the interior of said furnace, said wall means including access means therein horizontally spaced from said tap hole and through which granular material may be inserted from exteriorly of said furnace and said downwardly opening compartment, through the latter and through said tap hole into said furnace for damming said floor inward of said tap hole, and also through which a tool may be inserted for raking up and withdrawing said granular material dam through said tap hole into said downwardly opening compartment.

4,227,470

PLACKET FORMING SYSTEM

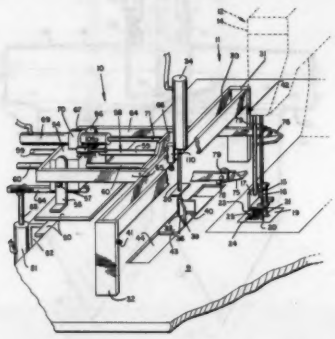
William O. Mitchell; Gordon H. Ellington, and C. Ray Hamilton, all of Vidalia, Ga., assignors to Oxford Industries, Inc., Vidalia, Ga.

Filed Sep. 14, 1978, Ser. No. 942,431
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 6 Claims

1. In combination with a sewing machine, apparatus for cutting garment parts and the like at a position located a predetermined distance from said sewing machine, said apparatus comprising mounting means for attachment to a work surface, a support member pivotally mounted about a horizontal axis on said mounting means, a garment engagement means supported by said support member, means for distending and retracting said garment engagement means with respect to said support member, and means for pivoting said support member and said garment engagement means simultaneously about said horizontal axis, cutting means positioned at said work surface between said sewing machine and said support member whereby said

means for pivoting said support member and said garment engagement means moves said garment engagement means downwardly into engagement with a garment part located at the sewing machine, and after the garment engagement means has engaged a garment part at the sewing machine said means for distending and retracting said garment engagement means retracts the garment engagement means to pull the garment part with said garment engagement means away from said sewing machine across the work surface, and said cutting means cuts the garment part after the garment part has been moved a predetermined distance from the sewing machine.

6. In combination with a sewing machine, apparatus for positioning and cutting garment parts and the like at a predetermined distance from the sewing machine for engaging the



garment part when the garment part is at the sewing machine needle and for moving the garment part from the sewing machine needle to said garment cutting apparatus and for returning from the garment cutting apparatus to the sewing machine needle, and control means including means responsive to the movement of the positioning apparatus when the positioning apparatus has moved the garment part from the sewing machine needle to the cutting apparatus for actuating said cutting apparatus so that the cutting apparatus cuts the garment part before the positioning apparatus returns to the sewing machine needle, means responsive to the movement of the cutting apparatus after the cutting apparatus has cut the garment part for actuating said positioning apparatus so that the positioning apparatus returns to the sewing machine needle.

4,227,471

SEWING-MACHINE GUIDE FOR EDGE-PARALLEL SEAMING OF A WORKPIECE

Harald Collbrunn, Spenge; Franz Hannemann, Detmold, and Heinz Fransing, Melle, all of Fed. Rep. of Germany, assignors to Dürkoppwerke GmbH Bielefeld, Bielefeld, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,143

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728967

Int. Cl.[2] D05B *35/10*

U.S. Cl. 112—121.26 **10 Claims**

1. In combination with a sewing machine adapted to stitch an edge-parallel seam in a workpiece comprising a stack of a plurality of fabric layers and having a stitching location and means for advancing the workpiece past said stitching location, the improvement which comprises:

a workpiece guide device disposed immediately ahead of said stitching location with respect to the direction of advance of the workpiece therepast, said workpiece guide device comprising:

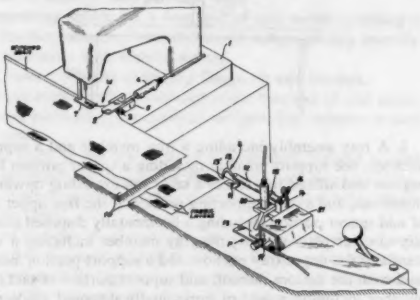
a plurality of plates interleavable with the layers of the workpiece, and

an edge guide engageable with the edges of said layers for positioning same to be fed past said location;

a drag-clamp device comprising:

a guide track extending toward said location and formed by a guide rail mounted on a worktable extending laterally from said sewing machine,

a drag-clamp displaceable on said guide track and engageable with said workpiece at a location therealong distal from the stitching location upon inception of the seam, and



means cooperating with said drag clamp for applying traction to the workpiece along the edge to be seamed;

a retracting means connected to said workpiece guide means and actuatable for drawing same out of the path of said drag clamp;

control means along said track operably by the passage of the drag clamp therealong for actuating said retracting means to withdraw said guide workpiece device out of the path of said drag clamp and enable said drag clamp to approach said stitching location.

4,227,472

SEWING MACHINE WITH ELECTRONIC PATTERN DATA CIRCUITS

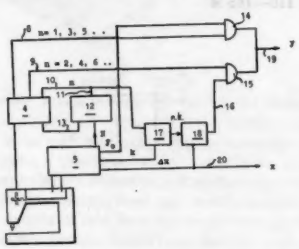
Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna AB, Huskvarna, Sweden

Filed Mar. 28, 1978, Ser. No. 891,006

Claims priority, application Sweden, Mar. 29, 1977, 7703574

Int. Cl.[2] D05B *3/02*

U.S. Cl. 112—158 E **5 Claims**



1. In a sewing machine with electronic pattern data circuits for the generation of data signals, at least one motion converter means for producing, as a function of said signals, movements of the stitch forming elements of the machine, said movements generally comprising a sideways and vertically moving needle operating in conjunction with a fabric feeder and shuttle, an improvement wherein said data circuits comprise:

pattern select means for permitting a sewing machine operator to select a desired stitch pattern;

storage unit means for storing algorithm parameters and in

response to said pattern select means, providing said parameters to an output;

stitch counter means for providing stitch count signals; and

algorithm computer means, responsive to said output of said storage unit means and said pattern select means, for computing coordinates of a necessary point of needle penetration and providing signals to said motion converter means to orient said needle in accordance with the desired stitch in the pattern.

4,227,473

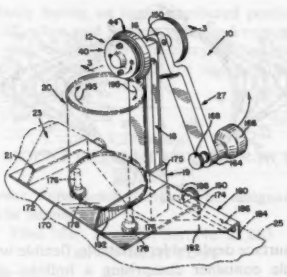
CAN EDGE RIDING CAN OPENER

Claude A. Young, 126 N. Kensington St., LaGrange, Ill. 60525

Continuation-in-part of Ser. No. 855,552, Nov. 29, 1977, abandoned. This application Mar. 8, 1979, Ser. No. 18,593

Int. Cl.³ B21D *39/03*

U.S. Cl. 113—1 K **22 Claims**



1. A can opener of the type adapted to open cans by unfolding the can ridge that is formed at one end of the can by folding the end rims of the can end closure and can side wall against the side of the can to define one ridge edge that projects away from the can, a second opposing ridge edge that lies about the can side wall, and a composite flange structure separating said ridge ends that lies about the can side wall in juxtaposition therewith and defines inner and outer ridge side wall sides in circumambient relation about the can ridge, said opener comprising:

a clamping disc, a traction disc, and a wedge disc in coaxial relation about a common rotational axis,

said traction disc being interposed between one side of said clamping disc and one side of said wedge disc,

said traction disc having its periphery knurled for riding on the can said one ridge edge in the operative position of said opener with said clamping disc one side facing the ridge inner wall surface and the wedge disc one side facing the ridge outer wall surface,

said clamping disc being proportioned to define a rim portion projecting radially thereof beyond said traction disc periphery and having said rim portion thereof on said one side thereof smoothly contoured for camming engagement with the can ridge inner side,

and means for rotating said discs about said axis to roll said traction disc along the can ridge one edge in the direction to roll said wedge disc wedging rim in wedging camming relation against the can ridge second edge for swinging the can ridge flange structure about the can ridge one edge and away from the can side wall, as said discs roll along the can ridge, to separate the can end rim from the can side wall rim.

4,227,474

CATAMARAN EQUIPPED WITH RE-RIGHTING DEVICE

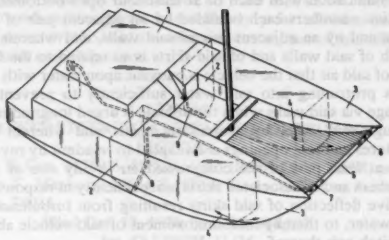
Gunter Ullrich, Regenwalderweg 36, 1 Berlin 27, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,650

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1977, 2727074

Int. Cl.³ B63B *1/00*

U.S. Cl. 114—61 **2 Claims**



1. A cruiser catamaran comprising:

forward hulls having floodable forecastles, and buoyancy chambers disposed forwardly of said forecastles and communicating therewith;

a watertight cabin disposed in the stern of said cruiser catamaran and separated from said forecastles by bulkheads;

an openable and closable inlet for introducing compressed air into said buoyancy chambers, said inlet being arranged at the anterior end of said buoyancy chambers; and

simultaneously actuable flooding means for flooding said forecastles and buoyancy chambers, whereby after capsizing, re-righting may be effected by initially activating said flooding means so that said forecastles and buoyancy chambers become flooded, as a result of which the bow of the catamaran moves downwardly about 130° around its transverse axis, then the flooding means is closed and compressed air is introduced into the anterior buoyancy chambers through said inlet so as to return the bow and, in turn, the catamaran almost to its normal position.

4,227,475

WATERBORNE SIDEWALL AIR CUSHION VEHICLE

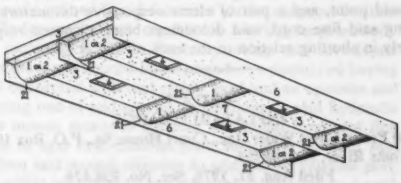
Darryl F. Mattox, 161 Pacific Rd., Palm Beach, N.S.W., 2108, Australia

Filed Apr. 12, 1978, Ser. No. 895,592

Claims priority, application Australia, Apr. 15, 1977, 24307/77

Int. Cl.³ B63B *1/38*

U.S. Cl. 114—67 A **11 Claims**



1. A waterborne air cushion vehicle comprising, in combination, a flat rigid upper rectangular sheet-like platform, a plurality of flat rigid longitudinal walls including at least two outermost walls, attached substantially at right angles thereto and depending therefrom substantially parallel with the major axis of said platform, the outermost two of said walls being disposed as sidewalls along the respective edges of said platform,

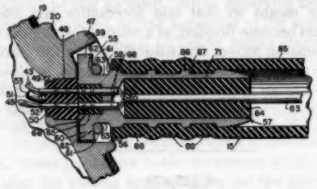
a plurality of longitudinally spaced laterally aligned arrays of flexible trough-shaped skirts respectively looped with a space therein and fastened via each longitudinal edge thereof with respect to the underside of said platform flush with but independently movable with respect to adjacent pairs of said walls but extendable to a lesser depth than that of said walls, a source of pressurised air admissible via apertures of fixed size at a relatively higher pressure to said skirts and also admissible at a relatively lower pressure via variable-sized openings capable of being remotely controlled and located in said platform in communication with each of at least four open-bottomed air cushion chambers each bounded by an adjacent pair of said skirts and by an adjacent pair of said walls, and wherein the depth of said walls and of said skirts is so related to the flow rate of said air that the vehicle is buoyant upon water with said walls protruding into said water sufficiently to prevent air spillage via said walls when the vehicle is urged longitudinally through said water by propulsion means, and wherein said apertures and said openings are adapted to re-admit by reverse flow at least part of the compressed air in any one of said chambers and its associated skirts independently in response to fugitive deflection of said skirts resulting from turbulence of said water, to thereby inhibit movement of said vehicle about the pitch axis thereof.

4,227,476

DETECTION STREAMER

Robert H. Park, Pluckemin, N.J.; Harold W. Klas, Washington, D.C., and Nelson N. Estes, Austin, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 526,624, Mar. 15, 1944. This application Oct. 14, 1954, Ser. No. 464,192
Int. Cl.[3] B63G *9/00*
U.S. Cl. 114—240 A **4 Claims**



1. In a torpedo detecting device of the class disclosed, the combination of an elongated hose-like member having a towing device secured to one end thereof whereby the member is adapted to be towed through a body of water, and means in said member and remote from said towing device for disconnecting said member at a predetermined point in closely spaced adjacency from the towing device comprising a helical coil of explosive fuse cord disposed only at said point and capable of sufficient explosive damage to sever the member substantially at said point, and a pair of electroresponsive detonators for firing said fuse cord, said detonators being disposed respectively in abutting relation to the ends of said cord.

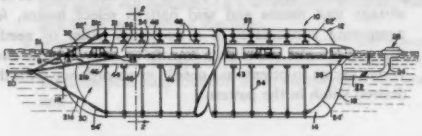
4,227,477

INFLATABLE BARGE

Paul Preus, Clean Water, Inc., Court House Sq., P.O. Box 1002, Toms River, N.J. 08753

Filed Aug. 31, 1978, Ser. No. 938,426
Int. Cl.[2] B65D *89/10*
U.S. Cl. 114—256 **9 Claims**

6. An air or surface deployable, inflatable, flexible wall, fluid holding towable container comprising a hollow, generally tubular, flexible wall container, at least one closeable inlet and outlet means for directing fluid into and out of the container characterized by gas inflatable barrier means extending at least along a substantial portion of the longitudinal side walls of said container in the zone of the water line of the container when it is filled with a liquid, wherein the inflatable barrier means



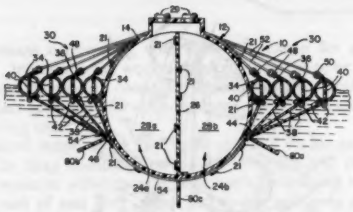
comprises a plurality of longitudinally extending barriers superimposed on each other and covering at least about 240 degrees of the external surface of the flexible wall container.

4,227,478

INFLATABLE BARGE WITH COMPARTMENTED INTERIOR

Paul Preus, 21 Smith Rd., Toms River, N.J. 08753

Filed Oct. 11, 1978, Ser. No. 950,279
Int. Cl.[2] B65D *89/10*
U.S. Cl. 114—256 **6 Claims**



1. An air or surface deployable, inflatable, flexible wall, fluid holding towable container comprising a hollow, generally tubular, flexible wall container, a vertically oriented partition extending the length of the container, a plurality of partitions positioned in spaced relation to one another extending transversely to the lengthwise extending partition, said length-wise extending and transverse partitions dividing the container into a plurality of compartments, closeable fluid filling-emptying ports in the top wall of the container, gas inflatable barrier means extending at least along a substantial portion of the longitudinal side walls of said container in the zone of the water line of the container when it is filled with a liquid;

said gas inflatable barrier means comprising a plurality of independently gas inflatable chambers arranged in a spaced array and connected together by impervious impregnated fabric, whereby rupturing of one of the plurality of independently inflatable chambers will not impair the function of the other of the chambers.

4,227,479

SUBMARINE COMMUNICATIONS SYSTEM

Morton Gertler, Silver Spring; Lester F. Whicker, and Thomas Gibbons, both of Rockville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 7, 1962, Ser. No. 215,468
Int. Cl.[3] B63G *8/00, 8/42*
U.S. Cl. 114—312 **9 Claims**

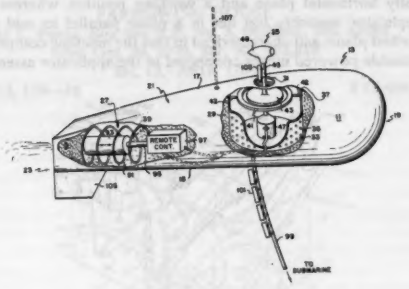
4. A towable sea-going vehicle for carrying communications equipment for use in conjunctive cooperation with communications equipment of another vessel comprising:

an essentially hollow body having openings in its walls for free flooding and self-bailing of said body;

said body having an essentially rounded, gently pointed nose section and a V-bottom portion, said V-bottom portion

providing a surface for the planing of said body on the surface of water and providing a face portion for contributing to the hydrodynamic lifting of said body when in an underwater position;

buoyancy producing means located in said body to the extent that the weight of said body in air is substantially less



than the excess buoyancy of said body when immersed in water;

and said body having an upper cambered portion for producing lift when said body is in an underwater position;

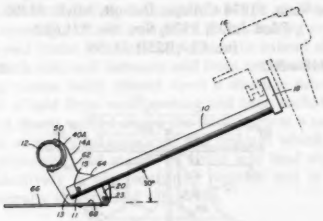
whereby said communications-carrying vehicle may be towed either submerged or on the water surface at speeds up to and in excess of 35 knots.

4,227,480

MOTOR MOUNT BRACKET FOR TWIN-HULL SAIL BOATS

Peter A. Carras, Palm Beach Gardens, Fla., assignor to Jane C. Terry, Hobe Sound, Fla.

Filed Mar. 16, 1979, Ser. No. 21,083
Int. Cl.[2] B63H *21/26*
U.S. Cl. 440—63 **10 Claims**



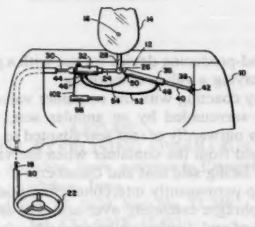
1. A motor mount bracket for use in combination with a twin-hull sail boat of the kind having first and second pontoons spaced parallel to each other by at least a first forward cross-strut and a second aft-most cross-strut to which the pontoons are rigidly attached, each pontoon extending a distance aft from the second strut and having first and second rudders pivotally connected to the aft-end of each pontoon, respectively, first and second rudder control arms extending from said first and second rudders, respectively, forward toward said second strut, and an elongated tiller link extending parallel to said second strut pivotally connected at first and second separated points to the forward ends of said first and second control arms, respectively, for moving said rudders in unison around their respective pivots, said forward connecting points and said rudder pivots defining the four corners of a parallelogram in which said tiller link is movable between a first position closely adjacent said second strut when said rudders are set dead ahead, and a second position further aft from said second strut when said rudders are set for a turn; said motor mount bracket comprising a stand-off intended to be fixed to said second cross-strut between the pontoons, said stand-off when so affixed extending below and aft of said second cross-strut and providing a mount pivot located below and aft of said second cross-strut and below said tiller link, rigid motor support means including an arm pivotally attached at a forward point to said stand-off at said mount pivot, said arm extending aft from said mount pivot and having fixed to it a mount for an outboard motor, said mount being located a prescribed distance aft from said mount pivot which prescribed distance is substantially less than the distance aft from said second cross-strut to said rudder pivots but sufficiently far aft from said second cross-strut to hold an outboard motor clear of said tiller link in said second position.

4,227,481

SAFETY STEERING SYSTEM FOR OUTBOARD MOTORS

Burton B. Cox, 11750 S. 85th E. Ave., Bixby, Okla. 74008, and Peter F. Maroney, 12634 S. 123rd E. Ave., Broken Arrow, Okla. 74012

Filed Oct. 13, 1978, Ser. No. 951,195
Int. Cl.[3] B63H *21/26*
U.S. Cl. 440—61 **2 Claims**



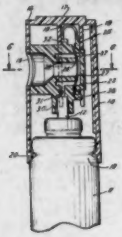
1. A safety steering system to control torque rotation for a boat having directable propeller outboard motor means capable of pivoting about a vertical axis in relation to said boat which comprises a motor arm on said motor perpendicular to said vertical axis for pivoting said motor; steering means to control movement of said motor about said axis; flexible cable means to exert either a push or pull force on said motor arm and having two ends, a first end of said cable means connected to said steering means and a second end of said cable means connected to said arm; actuator control valve means interposed along the connection of said flexible cable means with said motor arm, said control valve means including a first external port and a second external port; a hydraulic cylinder means having pivotal connections at its opposite ends pivotally attached at one end thereof to said boat and pivotally attached at the opposite end thereof to said motor arm, said cylinder means having a first chamber of confined liquid and a second chamber of confined liquid therein; a piston reciprocal within said cylinder means and capable of moving longitudinally therein including a piston head separating said first liquid chamber from said second liquid chamber; a piston rod having one end connected with said piston head and an opposite end constituting one of said pivotal connections on said hydraulic cylinder means; means to conduct said liquid from said first chamber to said first external port; means to conduct said liquid from said second chamber to said second external port; a stem within said control valve means responsive to a push force or a pull force from said cable means to provide fluid communication within said control valve means between said external ports and thus between said first and second chambers, said stem being movable in response to the cessation of said push force or said pull force by release of said steering means to interrupt communication between said ports thereby locking said arm in a single position; and a hydraulic accumulator connected to said control valve means for storing hydraulic

fluid therein and for providing fluid to compensate for the difference in volume between said first and second chambers of confined liquid.

4,227,482
PRESSURIZED FLUID-ACTUATED SOUND-PRODUCING DEVICE, AND METHOD OF ASSEMBLING IT

Christian T. Scheindel, Star Route, Randolph Center, Vt. 05061

Filed Jul. 13, 1979, Ser. No. 57,539
Int. Cl.³ G08B *23/00*
U.S. Cl. 116—142 FP **11 Claims**



1. A sound-producing device for use with a pressurized fluid container having a valve, comprising:

(a) a body coacting with the container valve and having an orifice surrounded by an annular seat, and a chamber radially outwardly of said seat adapted to receive pressurized fluid from the container when the valve is open,

(b) a cap facing said seat and chamber,

(c) a strap permanently interconnecting said body and cap,

(d) a diaphragm extending over said seat and chamber, the margin of said diaphragm being sandwiched between said body and cap,

(e) means for locking said body and cap in tight engagement so that they tightly grip said diaphragm between them and hold said diaphragm taut over said seat, and

(f) means carried by at least one of said body and cap for deforming the margin of said diaphragm to aid in tightly gripping said diaphragm between said body and cap,

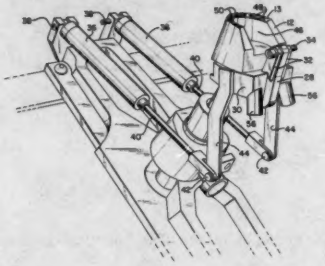
whereby pressurized fluid which enters the chamber escapes therefrom by flowing between the tautly-held diaphragm and said seat and then out the orifice, thereby causing the diaphragm to vibrate and create a sound.

4,227,483
ADHESIVE APPLYING MACHINE

Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Oct. 26, 1978, Ser. No. 955,032
Int. Cl.³ A43D *25/18, 25/047;* B05C *5/02*
U.S. Cl. 118—411 **2 Claims**

1. An adhesive applying machine comprising: a support having a top surface lying in a prescribed plane that is inclined from the horizontal for so supporting a workpiece that the bottom of at least a portion of the workpiece substantially lies in said prescribed plane; an applicator assembly located below said workpiece portion; connecting means connecting the applicator assembly to an applicator mount; means mounting the applicator mount for heightwise movement between a lower position wherein the applicator assembly top is spaced from said workpiece portion and an upper position wherein the applicator assembly top lies in said prescribed plane and bears against said workpiece portion; adhesive feeding means actuable to expel adhesive from the applicator assembly top onto said workpiece portion; means for initially retaining the applicator mount in said lower position; means for thereafter raising the applicator mount to said upper position; means for actuating the adhesive feeding means while the applicator mount is in said upper position; and means for thereafter lowering the applicator mount to said lower position; characterized in that said connecting means so connects the applicator assembly to the applicator mount as to enable movement of the applicator assembly relative to the applicator mount between an idle position wherein the applicator assembly top lies in a substantially horizontal plane and a working position wherein the applicator assembly top lies in a plane parallel to said prescribed plane; and characterized in that the machine comprises: actuable powered means connected to the applicator assembly

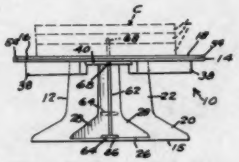


for moving the applicator assembly between said idle and working positions; means for so initially actuating the powered means as to initially retain the applicator assembly in said idle position; means effective by the completion of the rise of the applicator mount from said lower position to said upper position to so actuate the powered means as to cause the powered means to move the applicator assembly to said working position; and means effective subsequent to the actuation of the adhesive feeding means to so actuate the powered means as to cause the powered means to move the applicator assembly from said working position back to said idle position.

4,227,484
CAKE FROSTING DEVICE

Humberto Vaca, 11874 College, Detroit, Mich. 48205

Filed Jul. 3, 1978, Ser. No. 921,852
Int. Cl.³ B25B *11/00*
U.S. Cl. 118—502 **16 Claims**



1. In a cake frosting device having a platter with an upper face adapted to support a cake layer and having an underside, a pedestal adapted to rest on a support surface and to support said platter in a position elevated above said surface, said platter having a plurality of apertured portions each of which opens at said upper face and said underside, and a plurality of pins dimensioned to slide generally vertically through said apertured portions for impaling a cake layer on said platter, improved structure wherein,

said pedestal comprises a bottom, a top and a column extending from said bottom to said top,

said column having for each said apertured portion a side portion with a laterally outwardly opening recess having wall portions which extend from said bottom to said top,

said wall portions being positioned for engagement by a pin moved generally horizontally beneath said platter,

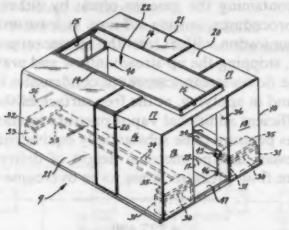
said wall portions of each recess extending toward a said apertured portion and being effective responsive to engagement therewith of a pin so moving to guide a said pin to a said apertured portion.

4,227,485

FARROWING HOUSE

Donald L. Poore, Box 140 R.R. No. 3, Shelbina, Mo. 63468

Filed Oct. 30, 1978, Ser. No. 955,610
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—16 **4 Claims**



1. A weather-tight and insulated sow farrowing house comprising: a frame structure having sides, a top and front and rear walls; a floor for supporting said frame structure; insulation enclosing said frame structure, and weather resistant sheathing covering said insulation; said top having an opening therein through said insulation and sheathing defined by outwardly projecting flanges; a cover structure removably fitted over said projecting flanges for retaining said cover in position closing said opening, said flanges being adapted to support said cover structure in partly raised position for ventilation of the interior of the house; said front wall having an opening for a door located substantially mid-way between said sides; a pig retaining guard fence operably mounted in said front wall opening adjacent said floor for presenting a barrier to egress of pigs without being a barrier for the sow; a door operably mounted at said front wall opening in position when in closed position over said opening to cover said guard fence; and pig protecting means in said frame structure in position to extend along the inside of each side wall between said front and rear walls, said protecting means being spaced apart a distance substantially the width of said front wall opening and each including load supporting means spaced above the floor to form a surface on which the sow may be supported and beneath which the pigs may be protected, and means to retain said load supporting means selectively in pig protecting position and in position shifted laterally toward said side walls.

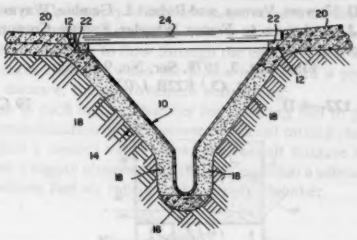
4,227,486

FARROWING PEN

Lynn E. Kaufman, and Jay S. Kaufman, both of R.R. 1, Moundridge, Kans. 67107

Filed Dec. 4, 1978, Ser. No. 966,090
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—28 **3 Claims**

1. A sanitary animal stall or farrowing pen comprising a slatted floor structure for supporting animals, a generally Y-shaped trough disposed below and communicating with said slatted floor, an overlay having a wing on each side thereof and generally co-extensive and mating with said Y-shaped trough and terminating in proximity to said floor, the surface of said overlay having a low co-efficient of friction such that manure and other waste generated by the animals are freely movable relative to said overlay, said Y-shaped trough comprising a footing supporting said overlay, particulate material supporting the sides of said overlay with said material resting on said footing, and concrete-like material situated in the uppermost section on both sides of said trough with said concrete-like material contiguous to said particulate material and imbedding the wings of said overlay and including a lip for



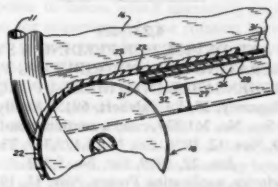
holding said slatted floor, the top of said slatted floor collimating with the top of said concrete-like material.

4,227,487

ANIMAL EXERCISING APPARATUS

Grover M. Davis, Audubon, Iowa, assignor to Emmert Manufacturing Co., Inc., Audubon, Iowa

Filed Jun. 27, 1979, Ser. No. 52,348
Int. Cl.³ A01K *15/02*
U.S. Cl. 119—29 **19 Claims**



1. An exercising apparatus for horses comprising:

a frame;

a first roller means rotatably attached to one end of said frame;

a second roller means rotatably attached to the other end of said frame;

support means attached to said frame between said first and second roller means for supporting an endless belt, said support means including a substantially flat piece of ultra high molecular weight polyethelyne plastic material;

an endless belt disposed over said plastic material and in direct contact therewith and around said first and second roller means;

power means for rotating said first roller means and thereby causing said endless belt to move around said first and second roller means and over said piece of plastic material;

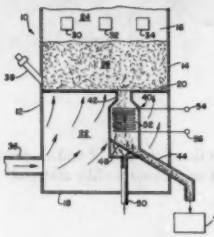
a groove disposed in said piece of plastic material; and

grounding means disposed in said groove and operatively attached to said frame for grounding static electricity caused by movement of said endless belt over said piece of plastic material to said frame.

4,227,488
FLUIDIZED BED UNIT INCLUDING A COOLING DEVICE FOR BED MATERIAL

Robert D. Stewart, Verona, and Robert L. Gamble, Wayne, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Oct. 3, 1978, Ser. No. 948,265
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—4 D **29 Claims**

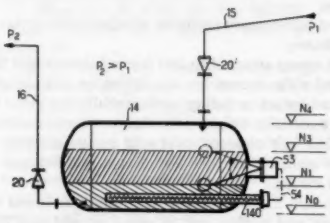


1. A fluidized bed unit comprising a housing, a fluid distributor plate disposed in said housing and dividing said housing into an upper chamber and a lower chamber, a bed of particulate material including fuel supported by said plate and extending in said upper chamber, said lower chamber having an inlet for receiving pressurized air for passing through said lower chamber, said plate and said bed of particulate material to fluidize said particulate material, an enclosure having an inlet communicating with said bed for receiving particulate material from said bed and an outlet for discharging said particulate material to external apparatus, an additional fluid distributor plate disposed in said enclosure over which said particulate material passes, and means for passing a cooling fluid through said additional plate and said particulate material in said enclosure to cool said material.

4,227,489
METHOD AND DEVICE FOR FEEDING A SYSTEM FOR GENERATING AND DISTRIBUTING VAPOR CONDENSABLE INTO MAKE-UP LIQUID

Pierre E. Regamey, 35, Le Calabert, 69130 Ecully, France

Division of Ser. No. 741,339, , and a continuation-in-part of Ser. No. 741,339, Nov. 12, 1976, Pat. No. 4,177,767. This application Jan. 22, 1979, Ser. No. 5,372
Claims priority, application France, Nov. 13, 1975, 75 34705; Sep. 13, 1976, 76 27510; Sep. 13, 1976, 76 27511; Jan. 23, 1978, 78 01773
Int. Cl.³ F22D *1/12*
U.S. Cl. 122—457 **39 Claims**

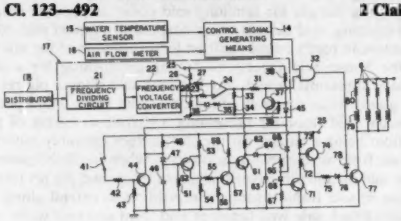


1. In a system, having at least one vapor generating boiler, one vapor utilizing condenser for production, distribution and utilization of condensable vapor, in a closed circuit wherein the pressure and temperature are substantially constant everywhere and identically the same at all points except for the pressure losses, with recovery of at least part of the condensates discharged by guided, preferably substantially dry and at least for the most part thereof generally gravitational return-flow in at least one closed container forming a main buffer-tank located at a general low point a method in particular for intermittent forced delivery of said condensates, for any selected one of the following purposes: direct reintroduction into said vapor-generating boiler, delivery into a higher-pressure system, passing of a geometrical rise such as a pitch-retaining arrangement by the discharge flow of condensates, the said method consisting in awaiting the obtention of a predetermined maximum level of filling of the said container with liquid; in isolating from the outside the upper space of the said container containing the gaseous phase by either one of the following procedures: cutting off any, at least unidirectional, fluid communication with at least the up-stream portion of the said system, stopping the up-stream inflow and preventing any return of the down-stream current of condensates into the said container; and in applying, at the free surface of the contained liquid, a sufficient additional vapor pressure to allow the total available gas pressure to be substantially equivalent to the sum of the necessary net geometrical height of delivery and the down-stream flow pressure losses to be overcome.

4,227,490
ELECTRONIC CONTROL FUEL INJECTION SYSTEM WHICH COMPENSATES FOR FUEL DRYING IN AN INTAKE PASSAGE

Nobuyuki Kobayashi; Toshio Suematsu, and Minoru Bitou, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 26, 1978, Ser. No. 919,296
Claims priority, application Japan, Feb. 13, 1978, 53-14056
Int. Cl.³ F02B *3/00*
U.S. Cl. 123—492 **2 Claims**



1. An electronic control fuel injection system of the type in which the supply of fuel through an injection valve to an engine is interrupted during the time that said engine remains in its decelerating condition comprising:

an injection valve provided in an intake system for said engine which is opened or closed in response to an electric current supplied thereto so as to supply fuel to said engine;

control-signal-generating means for computing an open duration of said injection valve in connection with the operational parameters of said engine and providing a fuel control output signal corresponding to said computation;

gate means for precluding the passing of said output signal from said control signal generating means therethrough, when the rotational speed of said engine remains over a predetermined value but said engine is in a decelerating condition;

fuel-supply-interruption-duration-detecting means for detecting that the time duration of interrupted fuel supply to said engine exceeds a predetermined value;

fuel-amount-increasing means responsive to the output of said fuel-supply-interruption-duration detecting means for generating an output pulse of a predetermined width when said engine is shifted from its decelerating condition to its accelerating condition after said fuel-supply-interruption time duration has exceeded said predetermined value; and,

actuating means for controlling an electric current to be supplied to said injection valve for actuating the same, said actuating means being operated according to the logical-sum of output signals from said control signal generating means and said fuel-amount-increasing means.

4,227,491

WARM-UP REGULATOR FOR ENRICHING THE AIR-FUEL MIXTURE DELIVERED TO AN INTERNAL COMBUSTION ENGINE

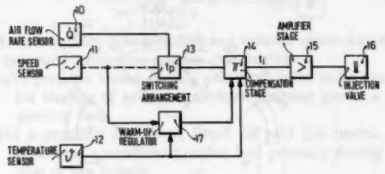
Hans Schnürle, Walheim, and Richard Bertsch, Asperg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,480

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1978, 2804391

Int. Cl.³ F02B 3/00

U.S. Cl. 123—488 **6 Claims**



1. A warm-up regulator device for enriching the air-fuel mixture delivered to an internal combustion engine comprising a fuel-metering system having a switching arrangement for generating metering signals responsive to a first group of operating parameters, a compensation stage which proportions said metering signals responsive to at least a second operating parameter, said compensation stage being connected and responsive to a function generator and said metering signals for producing a compensation signal which is speed-sensitive and a fuel-metering means controlling the injection of fuel into injection valves in response to said compensation stage.

4,227,492

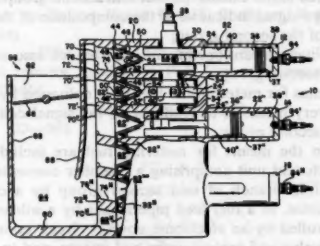
INTAKE MANIFOLD FOR A VERTICAL SHAFT ENGINE

Elmer A. Haase, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Jun. 21, 1979, Ser. No. 50,911

Int. Cl.³ F24C 1/16, 15/28; F24B 13/04; F24C 15/00

U.S. Cl. 123—59 B **7 Claims**



1. In a two stroke cycle vertical shaft internal combustion engine having a series of horizontal bores, each bore having an entrance port and an exhaust port, a piston located in each bore to establish a combustion chamber and a fuel-air mixture supply chamber, said entrance port being connected to said supply chamber, a manifold system establishes a mixing chamber adjacent to each supply chamber, each mixing chamber being connected to an inedpendent fuel supply and to a common air supply, and a control valve located between each mixing and supply chamber to allow a fuel-air mixture to enter the supply chamber on movement of the piston toward the combustion chamber and to prevent communication from the mixing chamber to the supply chamber on movement of the piston toward the supply chamber and allow the fuel-air mixture in the supply chamber to flow through the entrance port into the combustion chamber when the piston has moved a predetermined distance, the improvement comprising:

means in each mixing chamber for retaining fuel to prevent communication of fuel between adjacent mixing chambers when a control valve allows the fuel-air mixture to flow into a supply chamber and thereby maintain a substantially uniform fuel-air ratio of each supply chamber.

4,227,493

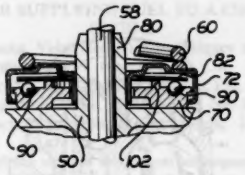
VALVE ROTATOR

Stanley H. Updike, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 7, 1979, Ser. No. 10,461

Int. Cl.³ F01L 1/32

U.S. Cl. 123—90.3 **17 Claims**



1. A rotator for a valve in an internal combustion engine which is reciprocable between open and closed positions along a longitudinal axis and is rotatable about said axis, said rotator including first and second parts movable axially relative to one another in response to forces which alternately increase and decrease, means for imparting relative rotation between said first and second parts upon relative axial movement of said parts, said means including shiftable means, means defining a pocket in one of said parts for receiving said shiftable means, a spring washer encircling said longitudinal axis and coacting between said first and second parts and in contact with said shiftable means for transmitting axial load between said parts through said shiftable means, and means coacting between said one of said parts and said spring washer to release the load on said spring washer from said shiftable means during at least a portion of the distance of relative movement of said parts.

4,227,494

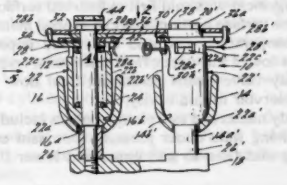
VALVE DISABLER AND CONTROL

Martin W. Uitvlugt, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 30, 1975, Ser. No. 627,424

Int. Cl.³ F02D 13/06; F01L 1/18

U.S. Cl. 123—90.16 **29 Claims**



1. An improved means for varying the amount a valve is

opened in response to pivotal movement of a rocker arm, said improved means comprising:

a support member;

fulcrum means slideably supported by said support member and adapted to provide a pivot surface for the rocker arm;

sleeve means slideable with said fulcrum means and projecting from said fulcrum means on the side opposite the pivot surface of the fulcrum means;

means retaining said sleeve means against rotation; and

latch means selectively moveable between a valve enabling position preventing sliding movement of said sleeve means and said fulcrum means and a valve disabling position allowing sliding movement of said sleeve means and said fulcrum.

4,227,495

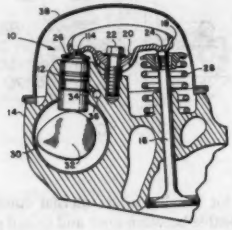
HYDRAULIC LASH ADJUSTER WITH OIL RESERVOIR SEPARATOR

John J. Krieg, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 21, 1978, Ser. No. 944,439

Int. Cl.[3] F01L *1/14, 1/24*

U.S. Cl. 123—90.55 **5 Claims**



1. A hydraulic lash adjuster for a valve gear of an internal combustion engine, comprising:

(a) body means having a blind bore formed therein, said body means including a contact surface adapted to contact associated engine valve gear components for receiving periodically applied forces;

(b) plunger means slidably received in said body bore and defining, in cooperation with the blind end of said bore, a cavity, said plunger means including,

(i) means defining a reaction surface adapted to contact associated engine valve gear components and transmit said periodically applied forces,

(ii) a lower plunger member having an opening therein;

(iii) an upper plunger member having an opening therein defined by a first internal surface and a first cylindrical surface adjacent the lower end of said upper plunger, said upper plunger further defining a transverse surface portion connecting said first internal surface and said first cylindrical surface,

(iv) separator means for fluidly isolating said lower plunger opening from said upper plunger opening, said separator means including a downwardly opening cup shaped member having outer peripheral surface portions in fluid sealing engagement with said first cylindrical surface and said transverse surface portion, said cup-shaped member defining in cooperation with said lower and upper plunger members lower and upper fluid reservoirs, respectively;

(v) one way valve means permitting fluid flow from said lower reservoir to said cavity;

(c) said body means and said plunger means including means for receiving fluid under pressure from said engine and directing said fluid to said upper and lower fluid reservoirs;

(d) said plunger means including means defining a passage communicating said upper reservoir with said reaction surface for directing fluid from said upper fluid reservoir to said reaction surface; and,

(e) means biasing said plunger means outwardly of said cavity.

4,227,496

FUEL SUPPLY DEVICES FOR INTERNAL COMBUSTION ENGINES

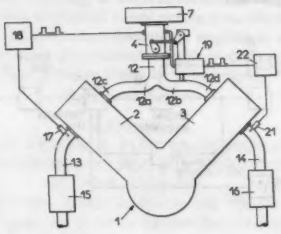
Bernard Martel, Bagneux, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly sur Seine, France

Filed Nov. 8, 1978, Ser. No. 958,813

Claims priority, application France, Nov. 10, 1977, 77 34043

Int. Cl.[3] F02M *7/00*

U.S. Cl. 123—440 **2 Claims**



1. A fuel supply device for an internal combustion engine having at least a first group and a second group of cylinders, each group having a separate exhaust pipe, comprising;

a manifold header having two manifold branches each adapted for connection to the cylinders of a separate one of said groups;

a carburettor connected to receive air and fuel and to deliver an air/fuel mixture to said manifold header, said caburettor, manifold header and manifold branches being so arranged that the branch associated with the first group receives an air/fuel mixture which is richer than the mixture received by the manifold branch of the second group;

a first probe adapted to be located in the exhaust pipe of said first group for delivering a signal indicative of the composition of the exhaust gas of said first group;

a regulation circuit associated with said probe and carburettor controlling the air/fuel ratio delivered by said carburettor in dependence of said signal;

and a correction circuit having a second probe adapted to be located in the exhaust pipe of said second group for delivering a signal indicative of the composition of the exhaust gas of the second group;

fuel delivery means opening into the branch associated with said second group;

and means for metering the fuel flow delivered by said fuel delivery means in dependence of the signal delivered by said second probe;

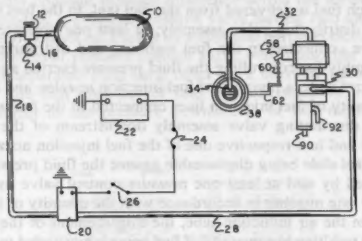
wherein the means for metering fuel are included in an enrichment unit comprising a chamber connected to the manifold branch of said second group by a calibrated restrictor, to a fuel feed pipe means by a solenoid valve controlled by an electronic control circuit connected to said valve and second probe and constructed to maintain the signal from the second probe at a predetermined value, to a source of air by air pipe means provided with an auxilliary throttle member operatively associated to an operator operable throttle member of the carburettor, whereby the air flow cross-sectional areas offered by the auxilliary throttle member and by the operator operable throttle member vary in opposite directions, and to the throat of a venturi provided in the air induction passage of the carburettor.

4,227,497

FUEL METERING AND TRANSFER CONTROL SYSTEM

Roy W. Mathieson, 6801 11th Ave., W., Bradenton, Fla. 33505

Filed Jun. 4, 1979, Ser. No. 45,212
Int. Cl.³ F02M *13/08*
U.S. Cl. 123—525 6 Claims



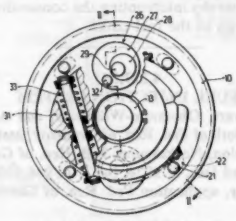
1. An auxiliary fuel metering and transfer control system for an internal combustion engine, comprising:
(a) a pressure vessel, having a shut-off valve and a gas outlet, for storage of propane, methane, natural gas or a similar gaseous fuel;
(b) a pressure regulator, fitted on said gas outlet, which maintains a constant gaseous fuel pressure during operation of the system;
(c) a metering valve which operates in response to changes in the intake manifold vacuum of the engine and changes in the air velocity in the carburetor of the engine;
(d) a transfer valve which operates in response to movement of the throttle linkage on the carburetor of the engine;
(e) an auxiliary fuel nozzle positioned immediately above the outlet of the main nozzle in the center of the Venturi of the carburetor;
(f) a fuel line for flow of gaseous fuel from said gas outlet of said pressure vessel into said metering valve;
(g) means for flow of gaseous fuel from said metering valve into said transfer valve; and
(h) a fuel line for flow of gaseous fuel from said transfer valve into said auxiliary fuel nozzle for injection into the Venturi of the carburetor.

4,227,498

CENTRIFUGAL GOVERNOR, PARTICULARLY APPLICABLE FOR THE ALTERATION OF IGNITION OR INJECTION TIMING IN INTERNAL COMBUSTION ENGINES

Leonhard Eberl, Unterschleissheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,736
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725414
Int. Cl.³ F02M *39/00*
U.S. Cl. 123—501 10 Claims



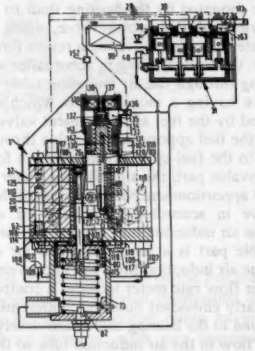
1. A centrifugal governor comprising first and second coaxial rotary members between which a driving connection is established such that, in use of the governor, the relative rotational position between the two rotary members varies in accordance with their speed, said first rotary member being in the form of an annular member defining within its periphery a space into which said second rotary member projects, said second rotary member including a bearing flange, the governor further comprising:
(a) a disc releasably attached to said first rotary member, said disc having plane parallel faces;
(b) two eccentric pairs, each comprising an adjusting eccentric and a compensating eccentric, the adjusting eccentric being mounted for rotation in said disc and the compensating eccentric being mounted for rotation in the adjusting eccentric, the compensating eccentric being articulatedly connected to said flange by a pin mounted at an eccentric position on the compensating eccentric; and
(c) two flyweights, each articulatedly connected to a respective adjusting eccentric by, on the side thereof facing away from said flange, a pin mounted at an eccentric position on the adjusting eccentric.

4,227,499

DEVICE FOR SUPPLYING FUEL TO A COMBUSTION ENGINE

Willem Brinkman, Velp, Netherlands, assignor to Holec N.V., Hengelo, Netherlands

Division of Ser. No. 665,533, Mar. 10, 1976, Pat. No. 4,120,617. This application Sep. 15, 1978, Ser. No. 942,775
Claims priority, application Netherlands, Jan. 21, 1976, 7000624
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.³ F02M *51/00;* F04B *17/04, 35/04*
U.S. Cl. 123—499 9 Claims



1. A device for supplying fuel to at least one atomizer of a combustion engine, in which the pump chamber of at least one fuel pump, arranged in a pump housing has a displacer volume adjustable by control-means, communicates through an inlet valve with a fuel inlet and through an outlet valve with a fuel outlet to be connected with the atomizer of the combustion engine and is limited by at least one displacer body caused to reciprocate by driving means, said control-means comprising at least one wedge-shaped stop actuated by a control-member, said stop being coupled through a piston rod with the piston of a control-cylinder communicating with the inlet manifold of the combustion engine, characterized in that the control-cylinder is centered with respect to a frame holding the pump housing by means of a centering disc extending into the control-cylinder.

6. A device for supplying fuel to the atomizer of a combustion engine comprising at least one pump to be connected with

the atomizer having a pump chamber limited by a piston and driving means for causing the piston to reciprocate, said driving means comprising an armature energized by at least one electro-magnet and adapted to reciprocate between stops characterized in that at least one of the stops is adjustable in accordance with the speed of the engine.

4,227,500

FUEL INJECTION APPARATUS

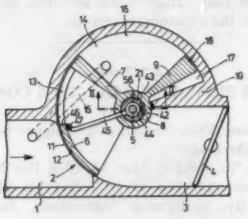
Wolf Wessel, Oberriexingen; Volkhard Stein, Stuttgart; Rudolf Sauer, Benningen, and Wolfgang Kienzle, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 945,048

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1977, 2742796

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—455 **18 Claims**



1. In a fuel injection apparatus for mixture-compressing, externally ignited internal combustion engines having an air induction tube into which continuous injection is maintained, the apparatus including: an arbitrarily actuatable throttle valve mounted in the air induction tube; a bearing shaft; an air flow rate meter mounted by the bearing shaft to the air induction tube in series with the throttle valve; means connected to the air flow rate meter for providing a return force to the air flow rate meter, the force varying in accordance with the air quantity flowing through the air induction tube; a fuel apportionment valve having a movable part which controls the fuel apportioned by the fuel apportionment valve; a fuel line connected to the fuel apportionment valve through which fuel is delivered to the fuel apportionment valve for apportionment by said movable part, the air flow rate meter being connected to the fuel apportionment valve to control the fuel apportionment valve in accordance with the air quantity flowing through the air induction tube, so that the fuel apportioned by the movable part is a function of the air quantity flowing through the air induction tube, the improvement wherein:

(i) the air flow rate meter includes a control body having a circularly embodied outer circumferential wall rotatably mounted to the bearing shaft transversely to the direction of air flow in the air induction tube so that the circularly embodied outer circumferential wall faces opposite the direction of air flow in the air induction tube; and

(ii) the circumferential wall controls, to a varying extent, a cross sectional opening of the air induction tube.

4,227,501

FUEL INJECTION APPARATUS

Heinrich Knapp, Leonberg, and Günther Jäggle, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

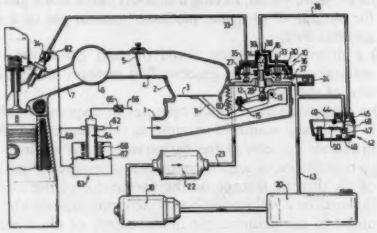
Filed Nov. 17, 1978, Ser. No. 961,808

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800614

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—453 **5 Claims**

1. In a fuel injection system for mixture-compressing, externally ignited internal combustion engines having an air induction tube into which continuous injection is maintained, the system including: an air flow rate member and an arbitrarily actuatable throttle valve mounted in the air induction tube in series in the direction of air flow; a fuel metering and distributing valve assembly including a control slide serving as a movable member of the fuel metering and distributing valve assembly; a fuel tank, a fuel supply line connected to the fuel tank and the fuel metering and distributing valve assembly through which fuel is delivered from the fuel tank to the fuel metering and distributing valve assembly; at least one pressure control valve connected to the fuel metering and distributing valve assembly for controlling the fluid pressure exerted against the control slide; a plurality of fuel injection nozzles; and an equal plurality of fuel injection lines connected to the fuel metering and distributing valve assembly downstream of the control slide and to a respective one of the fuel injection nozzles, said control slide being displaceable against the fluid pressure controlled by said at least one pressure control valve by the air flow rate member in accordance with the quantity of air flowing in the air induction tube, the displacement of the control slide resulting in a quantity of fuel being apportioned to the fuel injection valves by the fuel metering and distributing valve



assembly which is proportional to the air quantity flowing in the air induction tube, the improvement comprising:

a spring connected to the air flow rate member;

a filling valve connected to the fuel tank, said filling valve including a movable valve member and means providing a return force;

means defining a throttle point connected between the filling valve and the fuel tank; and

a plurality of scavenging lines connected to a respective one of the fuel injection lines and to the filling valve, wherein:

(i) the control slide is actuated when the engine is turned off by said spring in the direction of opening of the fuel metering and distributing valve assembly;

(ii) the scavenging lines are controlled by the filling valve in such a manner that the movable valve member thereof opens each scavenging line toward the fuel tank via the throttle point when the engine is turned off; and

(iii) the movable valve member of the filling valve is displaced, with a delay, against the return force in the closing direction of the filling valve by means of the pressure of the fuel being supplied when the engine is started, thereby interrupting the connection of the scavenging lines to the fuel tank.

4,227,502

FUEL INJECTION SYSTEM

Johannes Steinwart, Obersulm-Willsbach, and Armin Baüder, Neckarsulm, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union, Neckarsulm, Fed. Rep. of Germany

Filed Dec. 4, 1978, Ser. No. 966,490

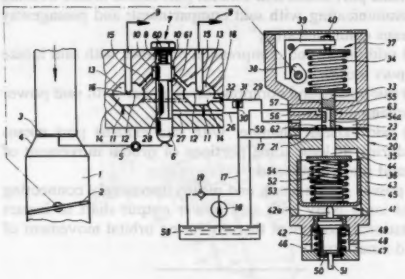
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1978, 2758065

Int. Cl.³ F02D *3/02, 1/06*

U.S. Cl. 123—454 **8 Claims**

1. A fuel injection system for a mixture compressing internal

combustion engine with spark ignition having a fuel injection nozzle for continuous fuel injection, an air intake duct, and an adjustable throttle valve in said intake duct, comprising: a flow sensing element in the intake duct arranged to move in accordance with the quantity of air flowing through said intake duct; a fuel metering valve, actuated by said flow sensing element, for dispensing a quantity of fuel which is substantially proportional or related to the quantity of air; means for maintaining a substantially constant pressure difference across the metering valve including a pressure sensitive valve having two chambers separated from each other by a movable partition element, and a differential pressure control valve which also has two chambers separated from each other by a movable partition element; the first chamber of said pressure sensitive valve being subject to the pressure downstream of said metering



valve, and comprising a valve aperture controlled by the associated partition element, said first chamber communicating with the fuel injection nozzle through the valve aperture; while the second chamber of said pressure sensitive valve communicates with the first chamber of said differential pressure control valve; a spring-loaded valve element element which is controlled by the partition element of said differential pressure control valve; a return line, said first chamber of said differential pressure control valve communicating with said return line via said spring loaded valve element, while the second chamber of said differential pressure control valve is actuated by the pressure upstream of said metering valve, and the partition element of said differential pressure control valve is actuated on both sides by resilient elements, whose loading stress can be varied according to engine operating parameters.

4,227,503

FUEL SUPPLY SYSTEM

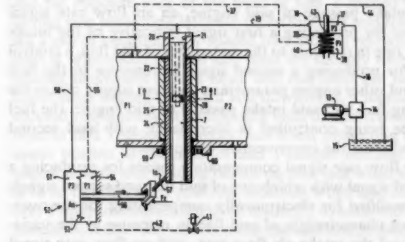
Wolf Wessel, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1979, Ser. No. 53,564

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1978, 2835710

Int. Cl.³ F02M *57/04*

U.S. Cl. 123—454 **6 Claims**



1. A fuel supply system for mixture-compressing, externally ignited internal combustion engines having an air intake conduit, in which an air flow rate meter and an arbitrarily actuatable throttle valve are disposed in sequence and the air flow rate meter is moved against a restoring force in accordance with the quantity of air passing therethrough to thereby adjust the movable part of a valve disposed in the fuel supply line for the apportionment of a quantity of fuel proportional to the quantity of air and in which said restoring force is generated by means of pressure fluid which being under substantially constant pressure continuously acts upon a control element operatively connected with the air flow rate meter to effect the restoring force with said pressure fluid being controllable by means of at least one pressure control valve, further wherein each said control element and said pressure control valve includes an air chamber separated from a fuel chamber by a yielding member with each said fuel chamber being subjected to the same fuel pressure upstream of said fuel apportionment valve and each said air chamber subjected to the same pressure in the air intake line upstream of the air flow rate meter.

4,227,504

LIMITATION APPARATUS FOR FULL-LOAD INJECTION QUANTITY IN A SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH FUEL INJECTION

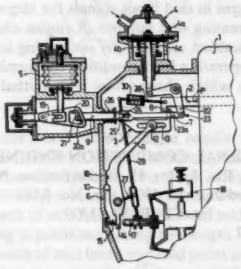
Ernst Ritter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,277

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1977, 2747083

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—380 **12 Claims**

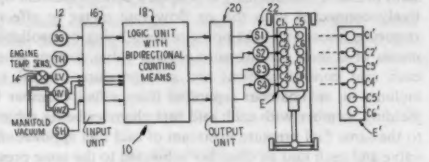


1. An apparatus for the limitation of the full-load injection quantity in a supercharged internal combustion engine with fuel injection including an injection pump having a supply quantity adjustment member, with two pneumatic control elements, one control element responds to the pressure differential between charge and atmospheric pressure to effect a charge-pressure-dependent limitation of the full-load injection quantity, and another control element embodied as a barometric cell is arranged to limit the full-load injection quantity in dependence on atmospheric pressure and both control elements act on said supply quantity adjustment member of said injection pump, and with a full-load stop which is disengageable for the attainment of an additional starting quantity which is greater than the full-load injection quantity, further wherein each of said control elements acts at least indirectly via deflecting elements on said full-load stop independently of one another and alternately relieving each other so that only one of said control elements determines the maximal full-load setting of said full-load stop for said supply quantity adjustment member of said injection pump and means disengaging said full-load stop when the engine rpm value.

4,227,505
VALVE SELECTOR CONTROL SYSTEM

Gerald L. Larson, Battle Creek; E. James Lane, Highland, and Robert S. Mueller, Birmingham, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 27, 1977, Ser. No. 791,493
Int. Cl.[3] F02D *13/06*
U.S. Cl. 123—198 F 24 Claims



1. A system for optimizing the number of combustion chambers to be operating in an internal combustion engine having a number N of combustion chambers and air or air-fuel mixture valves and combustion product exhaust valves for controlling charge flow to and from each of said chambers, said system comprising:

means actuable for alternatively enabling and disabling at least one of the air or air-fuel mixture valve and combustion products exhaust valve of selected chambers of said engine while the engine is operating;

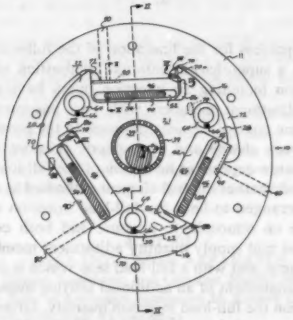
input means responsive to changes in specified engine operating load parameters for providing differing input signals;

logic means operatively connected to said valve enabling and disabling means for alternatively selecting between at least three different numbers N, N1 and N2 of chambers to be operating, where N is greater than N1 and N1 is greater than N2, said logic means being operatively responsive to certain changes in said input signals for stepwise increasing and decreasing said number of engine chambers having valves disabled, and thereby optimizing in response to changes in operating load condition the number of chambers through which charge flow is permitted.

4,227,506
INTERNAL COMBUSTION ENGINE

James R. Gurley, Rte. 5, Box 42, Rutherfordton, N.C. 28139

Filed Jan. 24, 1979, Ser. No. 5,964
Int. Cl.[3] F02B *53/00*
U.S. Cl. 123—227 6 Claims



1. An internal combustion engine comprising:

(a) a housing defining an internal compartment having at least one peripheral lobe;

(b) An inner body having at least one peripheral lobe thereon, means mounting said inner body in said compartment for non-rotational, orbital movement with said inner body lobe disposed for movement within said housing lobe during at least a portion of orbital movement;

(c) a recess in the periphery of said inner body adjacent said inner body lobe, a movable wall member disposed in said recess, and means mounting said movable wall member for movement in said recess and for movement toward an end of said compartment lobe in response to orbital motion of said inner body;

(d) portions of said movable wall member, inner body, and housing sealingly engaging each other to define a variable-volume fluid intake and compression chamber in said compartment, and to define a variable-volume power chamber and a variable-volume fluid exhaust chamber in said compartment lobe during at least a portion of orbital movement of said inner body;

(e) intake port means and exhaust port means in said housing communicating with said compartment; and passageway means communicating

(1) said intake and compression chamber with said intake port means,

(2) said intake and compression chamber with said power chamber, and

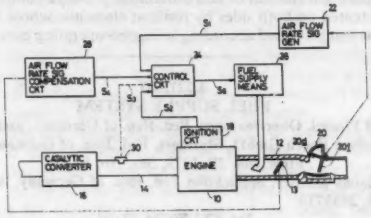
(3) said exhaust chamber with said exhaust port means during at least some portions of orbital movement of said inner body; and

(f) a power output shaft, and means operatively connecting said inner body with said power output shaft to impart rotational movement thereto during orbital movement of said inner body.

4,227,507
AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH AIRFLOW RATE SIGNAL COMPENSATION CIRCUIT

Sadao Takase, Yokohama; Masaharu Asano, and Nobuzi Manaka, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama City, Japan

Filed Apr. 13, 1978, Ser. No. 896,136
Claims priority, application Japan, Apr. 15, 1977, 52/42500
Int. Cl.[3] F02B *3/00*
U.S. Cl. 123—492 10 Claims



1. An air/fuel ratio control system for an internal combustion engine including an air flow meter having a flap disposed in the intake passage of said engine, an air flow rate signal generator for producing a first signal indicative of the intake air flow rate in response to the movement of said flap, a control circuit for producing a second signal in response to the first signal and other engine parameters, and fuel supply means for supplying fuel into said intake passage of said engine, the fuel flow rate being controlled in accordance with said second signal, wherein the improvement comprises:

an air flow rate signal compensation means for producing a third signal with which one of said first and second signals is modified for electronically compensating for the overshoot characteristic of said flap in response to the variation of the intake air flow rate, said air flow rate signal compensation means including:

(a) an ON-OFF type switch for detecting whether the angu-

lar displacement of the throttle valve of said engine is above a predetermined value or not;

(b) a differentiation circuit for differentiating the output signal of said ON-OFF type switch; and

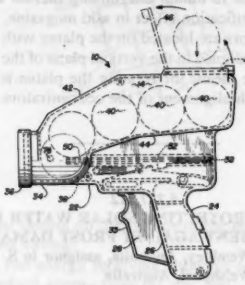
(c) means for applying a predetermined voltage to the output of said differentiation circuit for disabling said air flow rate signal compensation means.

4,227,508

TOY AUTOMATIC PISTOL FOR PING PONG BALLS

Bruce M. D'Andrade, Flemington, N.J., assignor to Arco Industries Ltd., Hong Kong, Hong Kong

Filed Dec. 22, 1978, Ser. No. 972,247
Int. Cl.³ F41B 7/08
U.S. Cl. 124—16 **3 Claims**



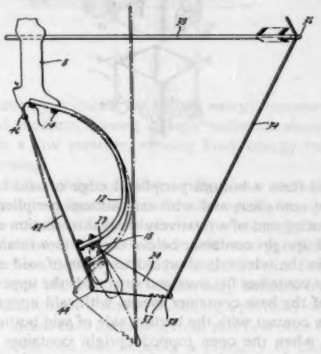
1. A toy pistol for holding a supply of and automatically firing ping pong balls comprising in combination, an elongated frame having a simulated barrel at the forward end thereof and a hollow handle having a forward open edge and extending downward from the axis of said frame adjacent the rearward end thereof, a magazine for storage of ping pong balls in the upper portion of said frame sloping upward and rearward from said simulated barrel and discharging into said simulated barrel, guide means extending along the axis of said frame from the rearward end thereof, a firing ram slidable along said guide means for movement axially of said frame from a retracted position therein to a fired position in which the forward end of the ram forcefully strikes a ball in the simulated barrel to fire it therefrom, and a compression spring at the innermost end of said guide means in said frame adjacent said rear end thereof and engageable with said ram to fire it forwardly when said spring is released from a compressed condition; the improvement comprising a rigid T-shaped member comprising a combination trigger and sear having the head thereof extending beneath the guide means and generally parallel thereto for axial movement between fully forward and rearward positions and the stem of said T-shaped member comprising the trigger and extending along the forward edge of said handle and movable into and outward from said open forward edge of said handle, said ram having a holding detent extending downward and the opposite ends of the head of said T-shaped member having pins projecting laterally therefrom and said frame having a pair of longitudinally-spaced forward and rearward guide slots in which said pins on said head are slidably received for guiding movement of said head, said rearward slot having an upper edge sloping rearward and downward, a tension spring secured respectively at its opposite ends to said frame and the head of said T-shaped member, and a sear projecting from the upper portion of the head of said T-shaped member and engageable with said holding detent on said ram when said head is in its fully forward position, whereby when said trigger on said T-shaped member is moved manually toward and into said handle, said head moves rearward and said compression spring is compressed and the tension spring is tensioned and the rearward pin on said head is moved downward along said upper edge of said rearward slot while moving rearward therein to compress said compression spring until near the end of said movement when the sear automatically disengages the holding detent to permit the compression spring to fire the ram against a ball in said simulated barrel and project it therefrom while said tension spring automatically restores said T-shaped member to the fully forward position thereof and in which the forward end of said ram is in its extended firing position in which it blocks movement of the next ball in the magazine from entering said barrel, said forward end of said rearward slot having vertical clearance to permit said pin in said slot to move downward incident to moving forward to restoring position and thereby allow the sear and holding projection to move past each other.

4,227,509

ARCHERY BOW HAVING CONTINUALLY DECREASING DRAW FORCE DURING DRAW

Glenn M. Jones, Roscommon County, Mich., assignor to GEC Associates, Inc., Troy, Mich.

Filed Mar. 15, 1978, Ser. No. 886,764
Int. Cl.³ F41B 5/00
U.S. Cl. 124—23 R **16 Claims**



1. An archery bow comprising a handle section provided with a pair of resilient limbs extending outwardly from said handle in generally opposite directions, a bowstring having a nocking point, first means connecting said bowstring to the end portion of each of said limbs remote from said handle such that the bowstring is positioned along the length of one side of said handle and each of said limbs and said point is movable from an at rest position to a plurality of drawn, limb flexing positions upon application of drawing forces to said bowstring, each of said limbs being arcuate in shape along its length and having a convex profile along the surface of said one side that is nearest said bowstring and a concave profile along its surface that is most remote from said bowstring, said first means including pivot means coupling a portion of said first means and said limbs such that the magnitude of the drawing force necessary to hold said point in any drawn position decreases as the distance between said any drawn position and the at rest position increases.

4,227,510

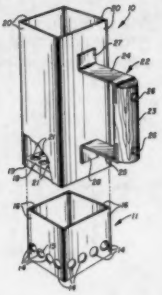
CHARCOAL BRIQUET LIGHTER

Robert D. Frazier, Triple Acres Ct., Rte. 1, Wayneville, Mo. 65583, and Dale E. Duncan, Rte. 1, Box 262, Crocker, Mo. 65452

Filed May 30, 1978, Ser. No. 910,666
Int. Cl.³ F24B 3/00
U.S. Cl. 126—25 B **10 Claims**

1. In a charcoal briquet ligher useful for quick efficient lighting of charcoal briquets in the lighter with the burning briquets then dumped in a broiler for use in broiling food: an

open topped upright container, of substantially uniform transverse plane cross-section from top to bottom, having an exterior handle and bottom retaining means with a plurality of openings generally materially smaller than charcoal briquet size; base container means of similar, but slightly smaller, cross-section in the form of a container for ignition starting material having a bottom plate, side breather opening means, and an open top; wherein said base container means is formed with an upper peripheral edge defining said open top; said upper peripheral edge is shaped to be a base support for said open topped upright container upon which said upright container is placeable and from which the upright container is removable; wherein said bottom retaining means is recessed



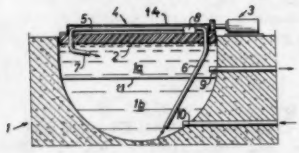
upward from a bottom peripheral edge of said open topped upright container; and with said bottom peripheral edge the terminating end of a relatively short skirt section of said open topped upright container below said bottom retaining means; wherein the relatively short skirt section of said open topped upright container fits over and surrounds the upper peripheral edge of the base container means with said upper peripheral edge in contact with the bottom side of said bottom retaining means when the open topped upright container is in place supported by said base container means; and wherein said bottom plate is recessed upward from a bottom peripheral edge of said base container means to give some protection to the surface supporting the base container means.

4,227,511

SOLAR COLLECTOR APPARATUS

Peter H. E. Margen; Rutger A. Roseen, and Heimo Zinko, all of Nyköping, Sweden, assignors to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Apr. 27, 1978, Ser. No. 900,799
Claims priority, application Sweden, May 6, 1977, 7705325
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—415 **15 Claims**



1. In a solar collector apparatus comprising a platen which is rotatable in a horizontal plane, a solar collector supported by the platen, means for rotating the platen in the horizontal plane such that the solar collector follows the sun, said solar collector comprising a plurality of a solar radiation concentrators, a heat absorber in the focus of each concentrator, and pump and control means for circulating a liquid through the heat absorbers and a liquid magazine, the improvements wherein:

the concentrators are elongated and arranged in parallel with each other,

the heat absorbers include conduits located in the focal line areas of the concentrators, said conduits having an inlet tube connected to one end thereof, which inlet tube extends near the bottom of said magazine to draw liquid therefrom, and an outlet tube connected to the other end thereof which dispenses liquid near the top of said magazine to thereby establish a relatively warm layer of liquid which floats on a relatively cool layer of liquid in said magazine,

the liquid magazine includes a separation foil arranged between the relatively cool and relatively warm layers in said magazine to inhibit intermixing thereof and thereby create a stratification effect in said magazine,

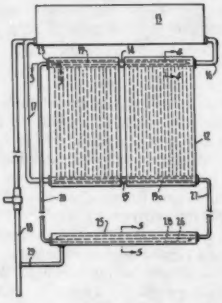
the concentrators are located on the platen with their longitudinal axes aligned in the vertical plane of the solar direction, and the means for rotating the platen is adapted to maintain such alignment of the concentrators.

4,227,512

MEANS FOR PROTECTING SOLAR WATER HEATING EQUIPMENT AGAINST FROST DAMAGE

Harry J. Riley, Wembley, Australia, assignor to S. W. Hart & Co. Pty Ltd., Welshpool, Australia

Filed Dec. 11, 1978, Ser. No. 968,145
Claims priority, application Australia, Dec. 15, 1977, PD2795
Int. Cl.[3] F24J *3/02*
U.S. Cl. 126—420 **4 Claims**



1. A solar water heater comprising a solar absorber header and being provided with means for protection against frost damage, wherein the means for protection against frost damage comprises

(a) a resilient collapsible tube within said solar absorber header, said resilient collapsible tube being closed at one end and open at the other end;

(b) a resilient vessel which is normally in a collapsed state, said resilient vessel being located externally of said header and being provided with an opening; and

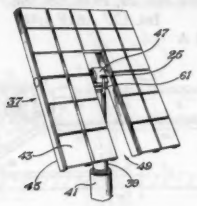
(c) a rigid pipe connecting the open end of said resilient collapsible tube with the opening of said resilient vessel, whereby, in use, a quantity of liquid is contained in said resilient tube and said resilient vessel is normally in a collapsed state but, if water in said header drops to a temperature at which it is subject to expansion, liquid is reversibly expelled from said resilient tube and passed through said rigid tube into said resilient vessel until the temperature of the water in said header rises.

4,227,513

SOLAR SYSTEM HAVING IMPROVED HELIOSTAT AND SENSOR MOUNTINGS

Floyd A. Blake, Littleton, Colo., and Lynn L. Northrup, Jr., Dallas, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 23, 1978, Ser. No. 953,469
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—425 5 Claims



1. In a solar system on the surface of the earth and exposed to the sun and having:

a. at least one energy receiving collector for receiving and using radiant energy from the sun; and

b. at least one reflector means for reflecting said radiant energy from the sun onto said collector;

the improvement comprising:

c. having said reflector means in the form of a heliostat that can be moved to maximize its reflected radiant energy onto said collector and configured so as to avoid interference with a co-mounted sensor;

d. means for moving said heliostat to maximize said radiant energy reflected on the said collector and through arcs that will not interfere with a co-mounted sensor;

e. dual purpose support structure carrying said heliostat and a sensor; said support structure being anchored firmly in the surface; and

f. a sensor controllably connected with said means for moving said heliostat for maintaining the maximum radiant energy reflected onto said collector; said sensor being mounted on said support structure and aligned with a straight line from said heliostat to said collector such that said sensor does not require an expensive, firmly anchored separate support structure to prevent receiving small surface movements different from those received by said heliostat;

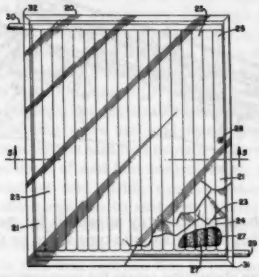
said heliostat having a central reflector; said heliostat adapted to be pivotably rotatable about a horizontal axis and a vertical axis through said central reflector such that the central perpendicular axis of said central reflector bisects and lies in the plane of the angle between the lines to, respectively, the sun and the collector so as to correct for both time, and seasonal diurnal movements of the sun and maximize the solar energy reflected onto said collector; said sensor being cantilevered from said support structure below said central reflector and aligned between the center of said central reflector and said collector; said heliostat having a slot below said central reflector so as to be pivoted without hitting said support structure and said sensor and cantilever mounting; said means for moving said heliostat including an elevational drive means for pivoting said heliostat to a desired angle about said horizontal axis; and said means for moving said heliostat including a rotation means for rotating said heliostat through a limited arc about said vertical axis.

4,227,514

SOLAR ENERGY COLLECTORS

Hermann J. Spitzer, 8004 Arcarde St., Lorton, Va. 22079

Division of Ser. No. 732,696, Oct. 14, 1976, Pat. No. 4,158,355.
This application Nov. 7, 1978, Ser. No. 958,475
Int. Cl.[3] F24J 3/02
U.S. Cl. 126—426 1 Claim



1. A solar energy collector for radiant energy exposure of a selected fluid medium, having a high radiation absorption coefficient, in a low pressure, moving fluid, energy transfer system comprising:

an opaque back member of substantially planar and substantially rectangular configuration and a substantially transparent front member of substantially planar and substantially rectangular configuration in spaced relation with two parallel elongated side sections defining a hollow chamber with first and second open ends and having a substantially uniform front to back depth, said hollow chamber including a plurality of elongated divider means each extending from said first open end to said second open end and defining a plurality of channels within said hollow chamber;

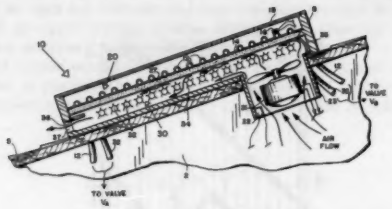
first and second manifold means coupled to said first and second open ends, respectively, of said hollow chamber and defining a substantially rectangular fluid container adapted to contain said fluid medium, said manifold means including fluid input means associated with said first manifold means and disposed in the vicinity of a first corner of said substantially rectangular fluid container, and fluid output means associated with said second manifold means and disposed in the vicinity of a second corner diagonally opposite said first corner, said fluid input means and said fluid output means connected to said first and second manifold means, respectively, such that fluid entering and exiting respective manifolds thereby moves in a direction orthogonal to the direction of movement of fluid in said plurality of channels defined by said elongated dividers;

said fluid input means and said fluid output means connected to said energy transfer system such that said substantially rectangular fluid container is an integral element of said system with said fluid medium of said system moving therethrough, said substantially rectangular fluid container being the radiant energy exposure element of said system and disposed with said transparent front member oriented to receive radiant energy from the solar energy source, said fluid container adapted for full fluid operation and said front to back depth thereof being inversely proportional, for any given radiant energy intensity, to the radiation absorption coefficient of said fluid medium; said fluid medium in said container being contained within a flexible transparent polymer bag structure disposed between said front member and said back member thereof.

4,227,515
DUAL PHASE SOLAR WATER HEATER

Robert I. Jacob, 614 N. Palmetto Ct., and Paul E. Jacob, Rte. 2, Box 658-D, both of DeLand, Fla. 32720

Filed Apr. 18, 1979, Ser. No. 31,059
Int. Cl.[3] F24D 5/04; F24J 3/02
U.S. Cl. 126—427 20 Claims



1. A dual-phase solar energy apparatus for mounting on a roof of a building having an attic-type space or the like comprising:

solar radiation absorption means for intercepting and absorbing solar radiation, said means having a first fluid-carrying grid for transferring absorbed energy to a fluid flowing therethrough;

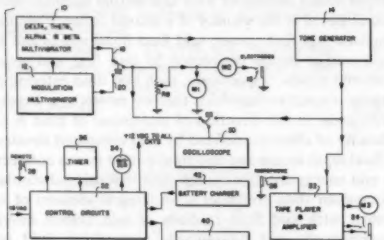
heat exchange means communicating with an attic-type space for receiving a flow of heated air therefrom, said latter means having a second fluid-carrying grid for transferring energy from the heated air to a fluid flowing therethrough; and

control means for controlling the flow of an input fluid through said first grid of said solar radiation absorption means and through said second grid of said heat exchange means in accordance with the temperature of the input fluid relative to the temperature of said first fluid-carrying grid and to the temperature of the heated air.

4,227,516
APPARATUS FOR ELECTROPHYSIOLOGICAL STIMULATION

Bruce C. Meland, 4525 Matilija Ave., Sherman Oaks, Calif. 91423; Bernard C. Gindes, deceased, late of Los Angeles, Calif., and by Hanna Gindes, executrix, 616 Hanley Ave., Los Angeles, Calif. 91423

Filed Dec. 13, 1978, Ser. No. 969,104
Int. Cl.[3] A61M 21/00
U.S. Cl. 128—1 C 15 Claims

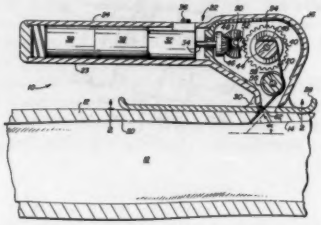


1. A system for producing electrophysiological stimulations in a patient so as to stimulate the effects of brain wave activity in at least one of the delta, theta, alpha and beta frequency ranges, said system including: first means for generating a first wave in a predetermined frequency range extending above the delta, theta, alpha and beta frequency ranges; second means for generating a second wave in at least one of said delta, theta, alpha and beta frequency ranges and connected to said first means to cause the first wave to be modulated by the second wave to cause the first means to produce bursts of the first wave occurring at the frequency of the second wave; and means connected to the first means for introducing the bursts of the first wave from the first means to electrode means mounted on the forehead of the patient for the electrophysiological stimulation of the patient.

4,227,517
CAST CUTTING SYSTEM

Robert H. Aguiar, 4510 Elderberry Dr., Orlando, Fla. 32809

Filed Jan. 29, 1979, Ser. No. 7,436
Int. Cl.[3] A61F 5/04
U.S. Cl. 128—91 A 12 Claims



1. A system for removing a casted wall from a human appendage, comprising:

a strand including an outer, non-metallic and non-toxic material embedded laterally through said wall at an inner surface thereof which is adjacent the human appendage;

means for severing said wall by drawing said strand into a cutting angle adjacent said inner surface and then through said wall, said severing means including a guide exterior of said wall and having a guide surface about which said strand is drawn, said guide surface being disposed substantially away from said cutting angle along the direction of travel of said severing means, whereby said strand is drawn through said wall at a substantially acute angle of less than 60 degrees said severing means comprising:

(a) a low-friction skid having a flat surface with a slot therein with said strand drawn through said slot, said flat surface of said skid for contacting the outer surface of said wall and maintaining said angular relationship with said strand during movement of said skid along said direction of travel, and whereby extraneous material may be removed from said strand during passage through said slot, with said skid positioned between said guide and said outer surface;

(b) a roller engaging said strand with means for rotating said roller for drawing said strand through said wall; and

(c) a motor having a drive shaft, and a gear drive coupled between said drive shaft and said roller.

4,227,518
INTRAMEDULLARY RETRACTION NAIL FOR FIXATION OF COMMINUTED FRACTURED BONES

Jacob Aginsky, 18 Rachel St., Haifa, Israel

Filed Jan. 23, 1979, Ser. No. 5,890
Claims priority, application Israel, Feb. 12, 1978, 54022
Int. Cl.[3] A61B 17/18; A61F 5/04
U.S. Cl. 128—92 BC 10 Claims

1. An intramedullary retraction nail comprising

An outer sheath the leading or front end of which is shaped to form an expansion element of a kind known to the art adapted to be biased against the cavity walls of a fractured tubular bone by expanding means likewise known to the art positioned and movable inside the sheath and adapted to be operated from the protruding trailing or rear end of said sheath, the front portion of said sheath, including the

expansion element, being provided with circumferential serrations in saw-shape, each serration decreasing in diameter from its front end to its rear end, the rear portion of said sheath being provided with outer screw thread interrupted by at least one flat, longitudinally extending surface,

an annular retractor body axially movable on the rear sheath portion consisting of a centrally perforated disc and an internally threaded nut attached to the rear of said disc, said disc and said nut being interconnected in a manner permitting their relative rotation about their common axis, but not their relative axial movement, the disc being prevented from rotating about the threaded sheath portion by being provided with a central perforation corresponding to the shape of the flattened profile of the sheath rear portion,

at least one perforated connector strip adapted to be attached to the bone side by means of screws or nails and provided with hook means adapted to hingedly engage with corresponding recesses in the disc of said retractor body, a U-shaped flat retaining piece comprising two legs spaced at a distance smaller than the largest diameter of each serration on said sheath, but larger than the smallest diameter of each serration.

4,227,519

RESPIRATOR FOR EMERGENCY AIR SUPPLY TO A PATIENT

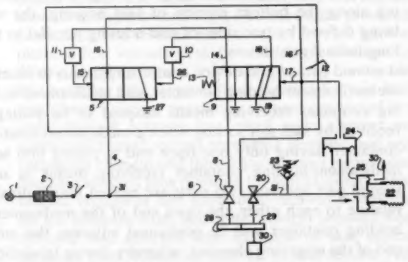
Detlef Warnow, Gross Grönau, and Hans-Jörg Ziebrecht, Lübeck, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,125

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735555

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—205.24 **4 Claims**



1. A respiratory gas supply system for a patient, comprising, a respiratory gas supply, first and second control valves, a first pressure line connected to said second control valve for influencing the regulation of the control position of said second control valve, a second pressure line connected from said first control valve to said second control valve for influencing the regulating position of said second control valve, a respiratory gas supply line having a first portion connected to said second control valve and a second portion connected from said first portion to said first control valve, a first regulating valve in said second portion, a respiratory discharge line connected from said second control valve to the patient, a second regulating valve in said respiratory discharge line, a first gas volume container of a predetermined volume in said first pressure line, a second gas volume container of a predetermined volume in said second pressure line, adjustable coupling means coupling said first regulating valve and said second regulating valve, spring means acting on said first control valve to influence the regulating position of said first control valve, a pressure control counteracting said spring means connected from said respiratory discharge line to said first control valve for also influencing the regulation of said first control valve, whereby, during an exhalation time T_1, said second control valve being controlled by said first pressure line to produce a continuous pressure rise from the resistance of said first regulating valve in said first volume up to a switching pressure of said second control valve to effect the subsequent movement of said second control valve to connect said respiratory air discharge line to said first portion of said respiratory gas supply line, said respiratory gas discharge line providing pressure to actuate said first control valve to connect said second portion to said second pressure line so that respiratory gas flows through said respiratory discharge line to the patient for inhalation, and when inhalation ends, thereby permitting the patient to exhale so that said first control valve is connected to said second pressure line and said second control valve is shifted to interrupt the connection of said supply line first portion to said discharge line to end inhalation, the beginning of exhalation being initiated by the resistance of said first regulating valve and the amount of said first volume, said spring means acting on said first control valve to provide a pressure to activate said second control valve.

4,227,520

SAFETY HELMET FOR MINERS

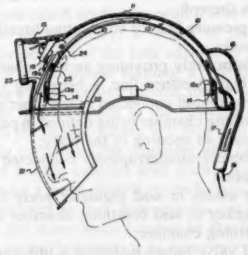
Ronald D. Lord, Toronto, Canada, assignor to Canadian Patents & Development Ltd., Ottawa, Canada

Filed Jan. 8, 1979, Ser. No. 1,423

Claims priority, application Canada, Feb. 10, 1978, 296,945

Int. Cl.[3] A62B *18/04*

U.S. Cl. 128—201.24 **2 Claims**



1. A miner's safety helmet comprising:

(a) inner and outer shells made of tough, hard impact resistant material having a generally hemispheric shape to conform to upper part of the wearer's head, the shells being spaced apart, closed around the rims thereof to form an enclosed space therebetween, and shaped around the

rims such that when positioned on the wearer's head, the wearer's ears are left uncovered,

(b) a slot like opening at the front part of the rim of the helmet into the enclosed space,

(c) a visor of transparent plastic material retractably and telescopically mounted in the slot and having a doubly curved shape to conform with the shape of the enclosed space such that when the visor is in a fully retracted position it lies almost completely in the enclosed space and when in fully extended position it extends over the face of the wearer,

(d) a source of clean filtered air,

(e) an air supply connection at the rear of the helmet connected to said source of clean filtered air, said air supply connection connected to the enclosed space between inner and outer shells,

(f) switch means mounted in the helmet in the enclosed space and operatively disposed in relation to the visor configuration, and

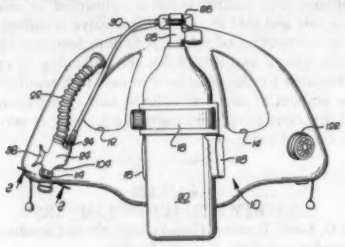
(g) means connected between the switch means and the air source, such that when the visor is in an extended position the switch is operative to turn on the air source to provide a flow of air down over the wearer's face inside the visor and when the visor is in partially or fully retracted position the switch is operative to turn off the air supply.

4,227,521

AIR SYSTEM FOR SCUBA DIVING

Dennis Hart, Hacienda Heights, and Masaru Shiroishi, Buena Park, both of Calif., assignors to Under Sea Industries, Inc., Compton, Calif.

Filed Dec. 13, 1978, Ser. No. 968,746
Int. Cl.³ B63C *11/22*
U.S. Cl. 128—202.14 **9 Claims**



1. In a breathing system for scuba diving:

(a) a buoyancy bag in the form of an inflatable jacket or the like;

(b) a hose connected at one end to the bag for inflation and deflation thereof;

(c) a high pressure line for conducting breathable air from a supply tank;

(d) a regulator body providing an inlet chamber connected to said high pressure line, a breathing chamber, and a buoyancy conduit connected to the other end of said hose said breathing chamber being defined in part by a movable wall closing an opening of the body;

(e) a mouthpiece uninterruptedly connected to said breathing chamber;

(f) conduit means in said regulator body connecting said inlet chamber to said breathing chamber to supply air to said breathing chamber;

(g) demand valve means including a link connected to said movable wall and a movable valve part in said conduit means connected to said link and operative to open and close said conduit means in accordance with the position of said movable wall in order to supply breathable gas in accordance with the demands of the diver;

(h) first valve means selectively connecting said inlet chamber to said buoyancy conduit, and including a first manual actuator mounted on said regulator body and spring means biasing said first valve means to close;

(i) second valve means selectively movable to an open position for providing an unrestricted bi-directional flow connection between said mouthpiece and said buoyancy conduit via said breathing chamber, and including a second manual actuator mounted on said regulator body, and spring means biasing said second valve means to close;

(j) an exhaust valve connecting said breathing chamber to atmosphere; and

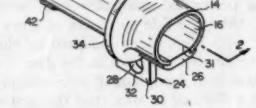
(k) means closing said exhaust valve while said second valve means is open to provide a direct breathing path between said buoyancy conduit and said mouthpiece.

4,227,522

INHALATION DEVICE

Milton C. Carris, Cupertino, Calif., assignor to Syntex Puerto Rico, Inc., Humacao, P.R.

Filed Sep. 5, 1978, Ser. No. 939,615
Int. Cl.³ A61M *15/00*
U.S. Cl. 128—203.15 **10 Claims**



1. A two-part breath-actuated inhalation device for dispensing a powdered medicament from a powdered medicament-holding container,

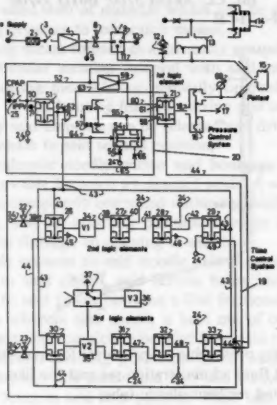
the first part of said device comprising an elongate housing having a passageway for the movement of air therethrough, one end of said housing being an output end adapted for insertion into the mouth or nasal passage of a user thereof, the passageway having an inlet end terminating in an emptying chamber at said output end of said housing, the cross-sectional area of the passageway being less than the cross-sectional area of the emptying chamber, and means for receiving the second part of said device, said receiving means being an elongate slot extending along the bottom portion of said housing, the slot being defined by two sides of said housing parallel to the longitudinal axis thereof;

said second part of said device comprising means to receive the medicament-holding container, said medicament-holding container receiving means adapted to be slidingly received by said slot so that when a medicament-holding container having only one open end is placed into said medicament-holding container receiving means in said second part and said two parts are moved longitudinally relative to each other, the open end of the medicament-holding container will be positioned adjacent the inner end of the emptying chamber, whereby during inhalation, a component of air flowing through the passageway flows into the medicament-holding container to dispense the medicament therefrom.

4,227,523
RESPIRATOR CONSTRUCTION

Detlef Warnow, Gross Grönau, and Hans-Jörg Ziebrecht, Lübeck, both of Fed. Rep. of Germany, assignors to Dräger werk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,409
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1978, 2801546
Int. Cl.³ A61M *16/00*
U.S. Cl. 128—204.24 8 Claims



1. A respirator, particularly for infants, for supplying respiratory gas to a patient selectively according to IPPV, PEEP, CPAP and IMV cycles, comprising:

(a) a respiration gas supply line connectable to a patient for supplying a respiratory gas;

(b) an expiration valve for switching from an inspiration phase to an expiration phase and back connected to said respiration gas supply line;

(c) a first logic element connected to said expiration valve for switching said expiration valve from an inspiration phase to an expiration phase and back;

(d) pressure control means connected to said first logic element for supplying gas at selected pressures to said first logic element for controlling said inspiration and expiration phases of said expiration valve for IPPV, CPAP and PEEP cycling;

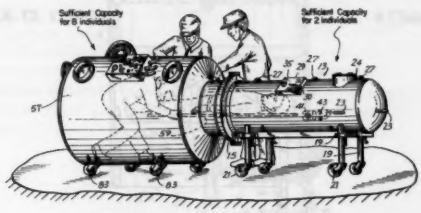
(e) time control means connected to said first logic element and said pressure control means for providing a selected time duration for said inspiration phase and a selected time duration for said expiration phase; and

(f) a static control pressure line associated with said pressure and time control means; said time control means comprising a first regulating element connected to said static control pressure line, second logic element means connected to said first regulating element, said first regulating element and said second logic element means provided for controlling said selected time duration for said inspiration phase, a first volume in said second logic element means fillable by gas pressure from said static control pressure line to define said selected time duration for said inspiration phase, a second regulating element connected to said static control pressure line, third logic element means connected to said second regulating element, said second regulating element and third logic element means controlling said selected time duration for said expiration phase, a second volume in said third logic element means fillable by gas pressure from said static control pressure line for defining said selected time duration of said expiration phase, a third volume connected to said second volume means, and a reversing switch connected between said second and third volumes, said third volume being fillable by gas from said second volume via said reversing switch to selectively add an additional time duration to said expiration phase whereby the respirator functions according to IMV cycles.

4,227,524
HYPERBARIC TRANSFER SYSTEM

Andre Galerne, 4 Cedar Island, Larchmont, N.Y. 10538

Filed Apr. 3, 1978, Ser. No. 892,867
Int. Cl.³ B63C *11/32*
U.S. Cl. 128—205.26 22 Claims



1. A hyperbaric system for transporting individuals comprising

a first manually transportable hyperbaric chamber having an elliptical access opening and an elliptical access hatch to cover said opening, said elliptical access hatch being provided with means for selectively opening and closing the access hatch from both within and outside of said first hyperbaric chamber, said first chamber including a life-supporting system within said first chamber for a plurality of individuals;

a second transportable hyperbaric chamber weighing less than about 2600 pounds having an access aperture and an access door to cover said aperture, said second chamber including life-supporting means within said second chamber for at least three individuals; and

means for coupling said access opening and said access aperture in a fluid tight relationship to permit movement of the individuals in said first chamber through said opening and said aperture into said second chamber when said access hatch and said access door are opened.

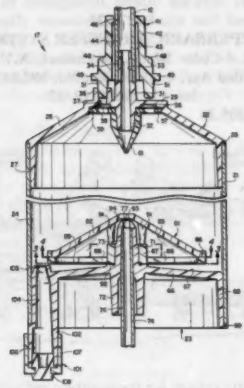
4,227,525
INTRAVENOUS ADMINISTRATION SET

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Filed Mar. 30, 1978, Ser. No. 891,595
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 R 20 Claims

1. In an administration set for use with a source of liquid to be administered intravenously, a length of flexible tubing, means carried by one end of the tube adapted to be connected to the source of fluid, means forming a vertically disposed container having a drip chamber therein, means connecting the other end of the flexible tubing to the chamber so that liquid flowing through the flexible tubing will flow into the chamber, a filter assembly carried by the container and having a dome shaped member having inclined wall portions impervious to liquid and defining a dome-shaped recess having a larger open end which is oriented to face downwardly, projecting means extending into the dome-shaped recess in the filter assembly and having an outlet flow passage in communication with the dome-shaped recess in the filter assembly, the filter assembly having an inlet opening into the dome-shaped recess and including a hydrophilic filter covering the inlet and providing the only flow passage means so that any air and liquid passing into the dome-shaped recess must pass through the hydrophilic filter and means in communication with the outlet passage adapted to be coupled to the patient, the filter assembly being

formed so that as liquid is introduced into the chamber, the hydrophilic filter will be progressively wetted to cause liquid to be introduced into the dome-shaped recess in the filter



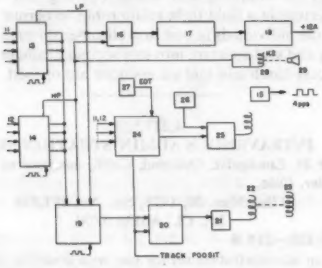
assembly and to cause substantially all of the air in the dome-shaped recess to be carried out of the dome-shaped recess by the passage of liquid from the dome-shaped recess into the outlet passage.

4,227,526

MECHANISM FOR AURALLY INSTRUCTING A PATIENT AND METHOD

Jack Goss, Pinellas Park, Fla., assignor to Extracorporeal Medical Systems, Inc., Pinellas Park, Fla.

Filed Apr. 13, 1978, Ser. No. 895,916
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—214 E **2 Claims**



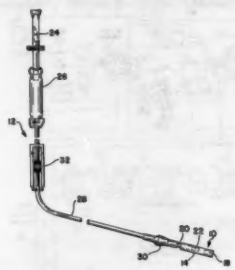
1. Mechanism for aurally instructing a patient as to a malfunction of a kidney dialysis machine connected to the patient's circulatory system, comprising: a kidney dialysis machine adapted to be connected to the patient's circulatory system, a plurality of sensor means operably associated with said machine and arranged to report malfunctions of a specific nature, said malfunctions being grouped into high priority items relating to the patient's blood and low priority items relating to the dialysate, selector means coupled to said sensor means to prioritize simultaneous reports from said sensor means and deliver an appropriate signal to audio means, and an audio means including a plurality of taped messages and speaker means selectively responsive to said signal from said selector means, said audio means also including a tape playback head capable of generating a signal reflecting tape playback head positioning, said selector means including a comparator for receiving a malfunction signal and a signal reflecting tape playback head positioning, comparing the same and delivering a signal to activate said playback head until a predetermined position is achieved whereby an unattended patient undergoing dialysis is given instructions for correcting said malfunctions.

4,227,527

STERILE AIR VENT

Michael P. De Frank, Woodstock, and James W. Scott, Lindenhurst, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 23, 1978, Ser. No. 953,576
Int. Cl.³ A61M *5/00*; B01D *39/06*
U.S. Cl. 128—214 R **4 Claims**



1. A sterility preserving tip protector for overfitting one end of a medical fluid administration set and the like comprising:

an elongated resilient plastic tube;

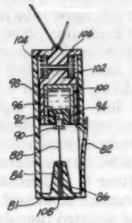
a unitary microporous sintered plastic filter element in the shape of a plug received within one end of said tube, the other end of said tube being open for fitting over one end of the administration set, said filter element having a pore size of between 10 and 20 microns inclusive, and a length of between 0.25 and 0.5 inches inclusive, to preserve sterility of the set and to readily pass gas therethrough.

4,227,528

AUTOMATIC DISPOSABLE HYPODERMIC SYRINGE

Stephen C. Wardlaw, 128 Sunset Hill Dr., Branford, Conn. 06405

Continuation-in-part of Ser. No. 955,773, Oct. 30, 1978, abandoned. This application Dec. 26, 1978, Ser. No. 972,756
Int. Cl.³ A61M *5/00*
U.S. Cl. 128—218 A **4 Claims**



1. An automatic disposable hypodermic syringe capable of storing a medicament for an extended period of time, said syringe comprising:

(a) a compact housing comprising a tubular part, a cap closing one end of said tubular part, and a base closing the other end of said tubular part;

(b) means securing said tubular part to said cap and said base to prevent ready disassembly of said housing;

(c) an ampoule disposed in said tubular part for movement between a first position and a second position, said am-

poule having a closed basal end and an opposite open end, said ampoule containing a dose of a medicament;

(d) an imperforate elastomeric piston disposed in and sealing said open end of said ampoule;

(e) spring means within said housing for biasing said ampoule from said first position to said second position;

(f) catch means within said housing for retaining said ampoule in said first position against the bias of said spring means, said catch means being formed as an integral part of said tubular member and being partially surrounded by a thin-walled web of material which can be ruptured by applying pressure to said catch means;

(g) actuating means formed as a manually graspable portion of said tubular member integral with said catch means, said actuating means being manually operable from the exterior of said housing for neutralizing said catch means whereby said ampoule can be released and driven by said spring means to said second position;

(h) a hypodermic needle within said housing, said needle being movable between a retracted position wherein said needle is completely contained within the confines of said housing, and an injecting position wherein said needle protrudes through an opening in said base;

(i) a ferrule secured to said needle and telescopingly connected to said piston, said ferrule being movable with respect to said piston between a first frictionally retained position wherein said needle is held out of contact with said piston and completely isolated from said medicament, and a second abutting position wherein said needle extends through said piston and into said medicament; said ferrule being in said first position when said needle is in said retracted position;

(j) means on said base for engaging said ferrule after said needle has been driven to said injecting position, said means being operable to hold said needle in said injecting position and cause said ferrule to move to said second abutting position; and

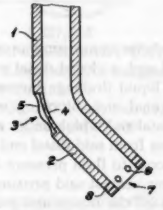
(k) sealing means for closing all joints and openings in said housing to retain a sterile condition within said housing.

4,227,529

TRACHEAL SUCTION CATHETER

Vagn N. F. Lomholt, Gentofte, Denmark, assignor to Molnlycke Steritex A/S, Espergaerde, Denmark

Filed Jan. 18, 1979, Ser. No. 4,354
Claims priority, application Denmark, Jan. 23, 1978, 325/78
Int. Cl.³ A61M *25/00, 1/00*
U.S. Cl. 128—276 **1 Claim**



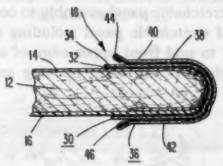
1. In a tracheal suction catheter of the type comprising a flexible, externally smooth tube whose outermost free end is open and is provided with a plurality of small apertures in the tube wall immediately adjacent the free, open end of the tube, the outermost portion of said tube being further formed with a side bend, there being a further aperture in said tube wall immediately adjacent the knee formed by said side bend, the provision of a depression in the outer surface of the wall portion surrounding said further aperture, the size of the further aperture and the size and number of said small apertures being related such as to obtain a substantially equal degree of suction force at the tube end and at the knee.

4,227,530

METHOD OF EMPLOYING RECLOSABLE FASTENER TAPE SYSTEM

Clarence H. Schatz, West Chester, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 724,983, Sep. 20, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,755
Int. Cl.³ A61F *13/16*
U.S. Cl. 128—287 **4 Claims**



1. A method of manipulating a disposable diaper, said diaper having front and back surfaces adapted to face toward and away from a wearer, respectively, when said diaper is placed on the wearer, said diaper including an adhesive tape fastener folded about a side edge of one segment of the diaper to provide a first tape section overlying the front surface of said one diaper segment and a second tape section overlying the back surface of said one diaper segment, said first tape section including an inwardly facing adhesive layer adhered to the front surface of said one diaper segment through an outwardly facing release surface and said second tape section being attached to the back surface of said one diaper segment through the cooperation of a release surface and an adhesive layer, said method including the steps of:

a. placing the diaper about the torso of a wearer with the front surface facing the wearer and end regions encircling the waist region of said wearer to bring a second segment of the diaper adjacent said one segment;

b. separating the first tape section from its release surface on the one diaper segment to expose the adhesive layer thereon and adhering the first tape section, through its exposed adhesive layer, to the back surface of the second diaper segment for initially retaining the diaper about the torso of the wearer, and, when the diaper is to be opened;

c. separating the second tape section from the back of the one diaper segment at an interface between the release surface and the adhesive layer that cooperate to attach the second tape section to the back surface of said one diaper segment.

4,227,531

PANTY LINER CONSTRUCTION

Syble A. McLeod, Box 64, Iron City, Ga. 31759

Filed Jun. 12, 1978, Ser. No. 914,593
Int. Cl.³ A61F *13/16*; A61B *9/04*
U.S. Cl. 128—288 **5 Claims**

1. A panty construction having a waist opening at its top and a pair of leg openings at its bottom comprising:

a non-stretchable panel assembly including a front section, a back section and a crotch section joining the front and back sections; said panel assembly formed into a panty shape and defining a pair of leg cutouts therein forming a portion of the leg openings in the panty construction, said front section defining opposed front side edges and a front upper edge thereon, said front side edges extending upwardly from the top of the leg openings toward the waist opening and said front upper edge extending between said front side edges, said front upper edge spaced below and

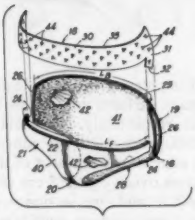
generally parallel to the waist opening, said back section defining opposed rear side edges thereon extending upwardly from the top of the leg openings toward the waist opening, said rear side edges spaced from said front side edges at the top of the leg openings; said panel assembly including:

an exterior fabric layer;

an interior liquid absorbent layer; and

an intermediate liquid impermeable layer between and separating said exterior fabric layer from said interior absorbent layer to prevent liquids absorbed by said interior absorbent layer from penetrating said exterior fabric layer; and

a stretchable panel connecting the front and back sections of said non-stretchable panel assembly to complete the panty shape, said stretchable panel including a central section connected to said front upper edge of said front section and extending to said waist opening and a pair of side



sections integral with opposite ends of said central section, each of said side sections extending between said front and rear side edges on said front and rear sections of said non-stretchable panel assembly from the top of the leg opening to the waist opening, each of said side sections connected to said front and rear side edges on said front and rear sections of said non-stretchable panel assembly so that said side sections of said stretchable panel permits relative movement between said front and back side edges of said front and back sections of said non-stretchable panel assembly over the leg openings to allow the panty construction to conform to different wearer body configurations in the same size range and said central section permits relative movement of said front upper edge on said front section of said non-stretchable panel assembly with respect to the waist opening to permit the panty construction to adjust to different abdomen configurations in the same size range.

4,227,532

DEVICE FOR CRUSHING CALCULI IN THE URINARY BLADDER

Karl H. Bluhm, and Helfrid Kunath, both of Hamburg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

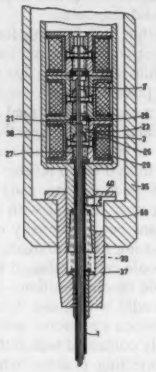
Filed Apr. 3, 1978, Ser. No. 893,069

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724324

Int. Cl.[3] A61B *17/22*

U.S. Cl. 128—328 **1 Claim**

1. A device for crushing calculi in the urinary bladder, comprising a bundle of independently reciprocatable, elongate, flexible lithotriptors disposed in a ureter catheter in a configu-



ration comprising a ring of lithotriptors arranged around a central lithotriptor.

4,227,533

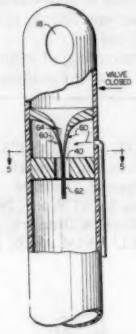
FLUSHABLE URINARY CATHETER

John C. Godfrey, Syracuse, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,554

Int. Cl.[2] A61M *25/00, 27/00*

U.S. Cl. 128—349 BV **10 Claims**



1. A urinary catheter comprising an elongated hollow tube having a proximal end, a closed distal end, a drainage port in said distal end, a liquid drainage lumen extending from said port to said proximal end, blocking means located in said lumen near said distal end which under normal conditions will permit urine to pass from said distal end to said proximal end, but which in response to fluid pressure applied on the side of said blocking means nearest said proximal end by a cleansing solution will close off the lumen and prevent fluid flow to or from said distal end, said blocking means being a valve which comprises in combination,

(a) a funnel shaped member including a large opening in communication with a small opening, the large opening being sealably engaged with the wall of said drainage lumen and located nearest said drainage port, and a passage connecting said openings, said passage extending in the direction of the longitudinal axis of said lumen, the walls of said passage nearest said small opening being more flexible than the wall nearest said large opening wherein the wall thickness of said passageway tapers from

a thick portion at the point of engagement with said drainage lumen to a thinner portion at said small opening, and

(b) a retaining means spaced apart from the large opening of said funnel shaped member in the direction of said proximal end, said retaining means comprising a solid portion which closes off a portion of said lumen and including an opening, such that the walls of said opening may be in contact with at least a portion of the flexible wall of said passage to permit urine to pass therethrough, whereby a chamber is formed between said funnel shaped member and said retaining means, and

means for introducing a cleansing solution into said lumen on the side of said blocking means nearest said proximal end in an amount sufficient to cause said blocking means to close and to flush contaminants out said proximal end, said introducing means comprising an opening in the sidewall of said lumen located between said funnel shaped means and said retaining means, said opening being in communication with a tube which extends from said opening towards said proximal end.

5. A flushable urinary catheter comprising:

a tube having a closed distal end and an open proximal end, said distal end adapted to be received in the patient's bladder;

a urine inlet port through said tube adjacent said distal end;

means defining a pressure chamber in said tube between said urine inlet port and said proximal end;

fluid pressure responsive valve means located in said pressure chamber for permitting urine flow from said urine inlet port through said tube toward said proximal end when open and for blocking off fluid flow in said tube between said urine inlet port and said valve means when closed;

means, coupled to said tube, for introducing a flushing fluid under pressure into said pressure chamber and for closing said valve means,

said means for introducing and closing including

a flushing fluid conducting member extending from said proximal end to said pressure chamber, and

a flushing fluid port at the end of said flushing fluid conducting member communicating with said pressure chamber for introducing the flushing fluid into said pressure chamber,

said pressure chamber having an orifice allowing the flushing fluid therein to flow therefrom toward said proximal end,

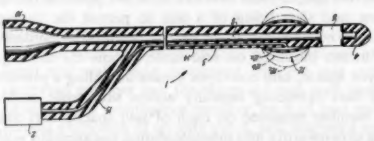
whereby the flushing fluid introduced into said pressure chamber closes said valve means preventing backflow thereof towards said urine inlet port, exits said pressure chamber via said orifice, and flows down said tube towards said proximal end, thereby flushing the interior of said tube.

4,227,534

SELF-INFLATING URINARY CATHETER

John F. La Rosa, West Kingston, R.I., assignor to International Paper Company, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,937
Int. Cl.³ A61M *25/00*
U.S. Cl. 128—349 B **11 Claims**



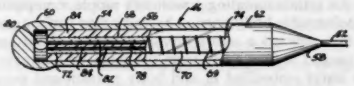
1. A self-inflating urinary catheter of the type which includes a retention balloon and an inflation lumen connected for conducting fluid to inflate the balloon wherein the improvement comprises a squeezable fluid reservoir connected to the inflation lumen, and means to squeeze the reservoir, said means including at least two parts of which one part includes a stretchable diaphragm adjacent the reservoir, said parts being arranged to be moved together with the reservoir between them thereby stretching the diaphragm and pressurizing the fluid, the stressed diaphragm exerting force on the fluid to expel it from the reservoir and through the inflation lumen to inflate the retention balloon.

4,227,535

PROCTOLOGIC DEVICE FOR THE THERAPEUTIC TREATMENT OF HEMORRHOIDS

Gerald I. Connor, Spokane, Wash., assignor to Bio-Tronics, Inc., Spokane, Wash.

Filed Apr. 2, 1979, Ser. No. 26,036
Int. Cl.³ A61F *7/12*
U.S. Cl. 128—401 **13 Claims**



9. A proctologic device for the therapeutic treatment of external and/or internal hemorrhoids projecting from the wall of a patient's anal canal which extends from the anus to the rectum and is surrounded by sphincter muscles; comprising;

an anal canal appliance for insertion into the anal canal through the anus;

said appliance having an elongated cylindrical metal envelope with an external heat transfer surface extending from a front end to a rear end for intimately contacting the anal canal and the projecting hemorrhoids;

said external heat transfer surface having a diameter sufficient to expand the anal canal and effectively transfer heat from the heat transfer surface to the anal canal wall and the hemorrhoids without painfully stretching the sphincter muscles;

said appliance having an electrical resistor heating element mounted internally within the cylindrical metal envelope for converting electrical energy to thermal energy;

said electrical resistor heating element comprising a cylindrical thermal insulative ceramic core mounted coaxially within the cylindrical metal envelope and an electrical resistor conductive material mounted on the insulative core;

a temperature transducer in direct engagement with the front end of the metal envelope to produce an electrical temperature signal corresponding directly to the temperature of the external heat transfer surface;

wherein the thermal insulation core is mounted within the metal envelope interposed between the electrical resistor conductive material and the transducer to form a thermal barrier to prevent direct heat transfer from the electrical resistor conductive material and the temperature transducer to minimize temperature sensing error;

a source of electrical energy;

a cable means extending between the source and the appliance for operatively connecting the source to the electrical resistor heating element;

control means operatively connected to the electrical energy source and responsive to the electrical temperature signal for automatically regulating the amount of electrical energy applied to the electrical resistor heating element to heat the external heat transfer surface and to maintain the external heat transfer surface at a preset temperature above body temperature to thereby relax the sphincter muscles and to facilitate the opening of vascular channels of the homorrhoids to facilitate shrinkage of the hemorrhoids.

4,227,536

ARTICLE IMITATING A PART OF A WOMAN'S BREAST

Marat Shimenkov, 65-46 Parsons Blvd., Apt. 2A, Flushing, N.Y. 11365, and Abraham Froyman, 110-20 Flave Apt. 308, Forest Hills, N.Y. 11375

Filed Mar. 7, 1979, Ser. No. 18,461
Int. Cl.³ A41C 3/10; A61F 1/00
U.S. Cl. 128—479 12 Claims

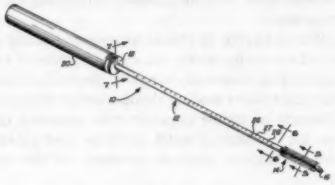
1. An article imitating a woman's nipple, comprising
a deformable body portion having a rear surface arranged to face toward a user's breast, a convex front surface arranged to face away from the same, and an axis; and
an insert embedded in said body portion and movable between at least two stable positions while remaining embedded in said body portion in which said insert and thereby said body portion surrounding said insert assume differing positions relative to said rear surface.

4,227,537

ENDOMETRIAL BRUSH WITH SLIDABLE PROTECTIVE SLEEVE

Thomas N. Suciu, and Herbert J. Schmidt, both of Tucson, Ariz., assignors to Tucson Medical Instruments, Inc., Tucson, Ariz.

Filed Mar. 8, 1978, Ser. No. 884,634
Int. Cl.³ A61B 1/00, 10/00
U.S. Cl. 128—756 12 Claims



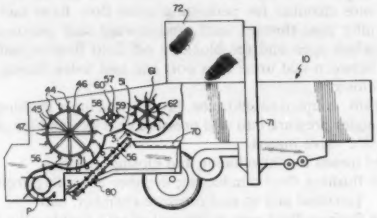
1. An endometrial brush for obtaining endometrial samples, said endometrial brush comprising in combination:
(a) a handle for manipulating said endometrial brush;
(b) a shaft having first and second end portions, the first end portion being attached to said handle, said shaft being rigid and bendable so that when said shaft is bent to a particular configuration, said shaft rigidly retains that configuration;
(c) a plurality of bristles attached to the second end portion of said shaft for collecting said endometrial sample, said bristles being oriented about the second end portion of said shaft to form a bristle section;
(d) a flexible sleeve slidably disposed on said shaft for covering said bristles during insertion of said endometrial brush into a patient's endometrium and exposing said bristles within the endometrium to permit scraping of cells and tissue from the endometrium by said bristles, said flexible sleeve having an outside diameter sufficiently small to enable insertion of said endometrial brush into the endometrium of the patient without substantial discomfort to the patient;
(e) first means connected to said sleeve for effecting sliding said sleeve along said shaft to cover said bristles during said insertion and sliding of said sleeve along said shaft to expose said bristles after said bristles are properly positioned in the endometrium; and
(f) rounded means attached to the end of said shaft for minimizing discomfort to the patient during insertion of said endometrial brush, wherein said sleeve sealably engages said rounded means if said sleeve is slid along said shaft so that one end of said sleeve slides over said bristles and over said rounded means, whereby no moisture, tissue, or cells contact said bristles during insertion of said endometrial brush.

4,227,538

SEPARATOR CONVEYOR FOR PEANUT COMBINE

William R. Long, and James H. Long, both of Tarboro, N.C., assignors to Long Manufacturing N.C., Inc., Tarboro, N.C.

Filed Sep. 29, 1978, Ser. No. 947,125
Int. Cl.² A01D 17/04, 17/08
U.S. Cl. 130—30 C 1 Claim

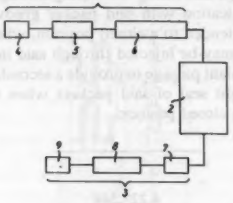


1. In a peanut combine for lifting and separating peanuts, vines and extraneous material and having a pickup, at least first and second threshing cylinders arranged on an incline upwardly and rearwardly from the pickup, a breastplate positioned beneath said first and second threshing cylinders, and a substantially horizontal shaker pan positioned beneath said second threshing cylinder but not beneath said first threshing cylinder, the improvement comprising said breastplate having first and second concave portions positioned below said threshing cylinders, each of said concave portions having a plurality of openings of a size to permit peanuts to fall therethrough, an inclined conveyor table having lower and upper ends and mounted beneath said first concave portion in a position to receive peanuts therefrom, said upper end of said conveyor table being mounted in a position to discharge peanuts onto said shaker pan, said conveyor table having a plurality of generally parallel longitudinally spaced slats, each of said slats having a generally flat upper surface which supports peanuts discharged from said first concave portion, the spaces between said slats being of a size to permit the passage of extraneous material but to retain the peanuts, an endless conveyor means mounted on said table, means for driving said conveyor means, said conveyor means including a plurality of spaced bars extending laterally across said table, a flexible wiper member mounted on each of said spaced bars and extending downwardly into intimate sliding engagement with the upper surfaces of said slats, whereby peanuts discharged from said first concave portion are moved upwardly along said conveyor table and are discharged into said shaker pan while extraneous material is discharged through the spaces between the slats of said table.

4,227,539
TOBACCO MOISTENING METHOD AND APPARATUS

Ian Kjaer, Hadsund; Christoffer Schlünssen, Aalborg SV; Hans J. Moller, Harlev J, and Niels E. Mortensen, Gistrup, all of Denmark, assignors to Skandinavisk Tobakskompagni A/S, Søborg, Denmark

Filed Jan. 16, 1979, Ser. No. 3,864
Claims priority, application Denmark, Feb. 3, 1978, 519/78
Int. Cl.³ A24B 9/00
U.S. Cl. 131—138 17 Claims



1. A method for moisture conditioning of tobacco leaves in substantially flat bunches, while maintaining the leaves in substantially the same shape and with the same relative position as in the untreated tobacco bunch, said method comprising:

partially immersing a bunch into a moistening liquid while holding the bunch in a substantially vertical position with its neck pointing downwardly

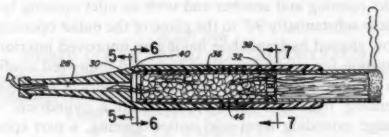
turning the bunch so that the neck points upwardly and subsequently mechanically shaking the bunch while holding it by its neck portion and limiting the movement of the leaves in relation to each other; and

shaking the bunch a second time after setting.

4,227,540
MENTHOL FILTER FOR CIGARETTES

Robert G. Edison, 3032 University Ave., Highland Park, Ill. 60035

Filed Jun. 23, 1978, Ser. No. 918,365
Int. Cl.³ A24F 13/02
U.S. Cl. 131—187 1 Claim



1. An elongated cigarette holder which includes a two-piece cigarette holder having a forward cigarette-receiving member and a rearward mouthpiece member, said members constructed to form a central cavity bounded by the opposed members, said cavity adapted to receive an elongated cylindrical filter cartridge; the improvement comprising, in combination:

said cylindrical filter cartridge having two end walls, each of said end walls having peripheral edge portions, the forward end wall being positioned adjacent said cigarette-receiving member and the rearward end wall positioned adjacent said mouthpiece member, each of said end walls having a plurality of arcuate vents, said rearward end wall having two arcuately shaped vents and said forward end wall having four arcuately shaped vents, the shaped vents in said rearward end wall providing greater flow-through capacity than the vent means in said forward end wall, and said cartridge being filled with menthol crystals;

said cigarette-receiving member constructed to sealingly engage the peripheral edge portion of the forward end wall of said cartridge, and said mouthpiece member adapted to sealingly engage said peripheral edge portion of the rearward end wall of said cartridge;

said central cavity being substantially cylindrically shaped, said mouthpiece member including a tapered wall adapted for engaging the peripheral edge portion of said rearward end wall of said cartridge;

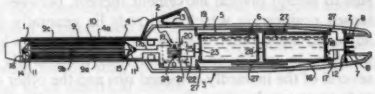
said forward end wall of said cartridge including flange means adapted to engage the inside wall of said central cavity as formed by said cigarette-receiving member so that substantially all of the fumes drawn from a cigarette in said receiving member to said mouthpiece pass through said cartridge and contact the menthol crystals therein; and

one of the mouthpiece member and the cigarette-receiving member having a reduced diameter extension which includes a plurality of outward biased tabs, the other of the mouthpiece member and the cigarette-receiving member having an end which includes a relatively smooth interior surface, whereby the mouthpiece member and the cigarette-receiving member are secured together by friction fit of the plurality of tabs against the smooth surface.

4,227,541
HAIR CURLING APPARATUS

David C. Satchell, Eastbourne, England, assignor to David Satchell Products Limited, Kent, England

Filed Aug. 23, 1978, Ser. No. 936,068
Int. Cl.³ A45D 2/24
U.S. Cl. 132—37 R 6 Claims



1. Hair curling apparatus comprising

(a) a handle,

(b) a tong portion secured to and extending from the front of said handle,

(c) a spring loaded clip mounted outwardly of said handle and said tong portion and biased toward the latter,

(d) an energy source in the form of electrical storage cells mounted within said handle,

(e) resistance element means mounted within said tong portion and comprising a plurality of individual strands the ends of which are commonly connected to electrical connector elements, each strand being encased in an insulating sleeve, with the strands and sleeves occupying substantially the entire area within the interior of said tong portion thereby reducing insulating air pockets within said tong portion,

(f) contact means for recharging said storage cells mounted in the rear end of said handle, the latter being open at such end for mating connection with a recharging source,

(g) a three-way switch mounted within said handle and including a switch actuator exposed exteriorly of said apparatus for operating said switch, said switch having terminal settings for alternately heating said resistance element means or recharging said storage cells, and a third position between said terminals for an off or deactuated condition, and

(h) circuit means electrically interconnecting said switch with said resistance element means, said storage cells, and said contact means for recharging said storage cells.

4,227,542

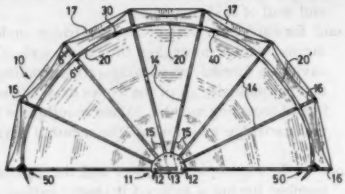
COLLAPSIBLE SHELTER

Paul Bonfilio, 47-25 198 St., Flushing, N.Y. 11358

Continuation-in-part of Ser. No. 783,250, Mar. 31, 1977, Pat. No. 4,098,281. This application Jun. 27, 1978, Ser. No. 919,635

Int. Cl.[2] A45F 1/16

U.S. Cl. 135—4 R 11 Claims



1. A collapsible shelter comprising:

a central hub;

a multiplicity of ribs radially spaced about at least a portion of said hub and extending radially outwardly therefrom, each of said ribs having an outer end and an inner end, the inner end of which is pivotably mounted on said hub to permit movement of said ribs between an open position, in which the outer end of the ribs are moved laterally away from one another, and a collapsed, closed position in which the outer ends of said ribs are disposed closely adjacent one another; a cover material secured to each of said ribs and interconnecting adjacent ones thereof; and

locking means for releasably securing said ribs in said open position, said locking means comprising at least one locking assembly, including a pair of elongated rods, each having an outer and an inner end, and each of which is pivotably secured at its inner end to one of the outermost ribs to permit pivotal movement thereof, between a collapsed position, in which said rods lie generally closely adjacent, and parallel, to said outermost ribs, and a locking position, in which one of said rods transversely spans several of the inwardly-disposed ribs and the other of said rods transversely spans the remaining inwardly-disposed ribs, means for demountably securing said rods to the respective ribs which they span, and means for detachably securing the outer ends of said rods together in said locking position thereof.

4,227,543

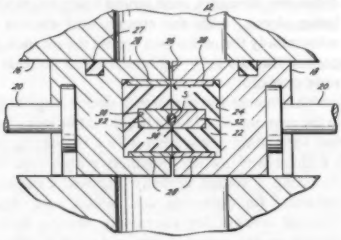
BLOWOUT PREVENTER

Leonard E. Williams, Jr., Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 18, 1978, Ser. No. 934,832

Int. Cl.[3] E21B 33/06; F16J 15/14

U.S. Cl. 137—246.22 8 Claims



1. A blowout preventer, comprising

a housing having a bore extending therethrough and opposed guideways intersecting the bore,

a ram slidably mounted in each of said guideways,

a packer positioned in the face of each of said rams,

means for extending and retracting said rams to close the bore in their extended position with said packers providing a seal across the bore and to open the bore in their retracted position,

each of said packers having a groove extending across its face transversely of said guideway,

the grooves of the two packers forming a sealant passage when said rams are extended to closed position, and

at least one injection fitting connecting through said housing in communication with said packer grooves when said rams are extended to a closed position, whereby a flowable sealant may be injected through said injection fitting into said sealant passage to provide a secondary seal and to assure a tight seal of said packers when said rams are extended to closed position.

4,227,544

FIRE HYDRANT WITH IMPROVED SHOE AND VALVE

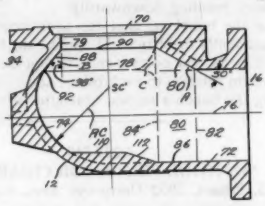
Lawrence F. Luckenbill, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.

Continuation of Ser. No. 762,511, Jan. 26, 1977, Pat. No. 4,177,826. This application Jan. 23, 1979, Ser. No. 5,848

The portion of the term of this patent subsequent to Dec. 11, 1996, has been disclaimed.

Int. Cl.[3] E03B 9/08; F16K 27/00

U.S. Cl. 137—307 24 Claims



13. An elbow shaped hydrant shoe having one end with an outlet opening and another end with an inlet opening lying in a plane substantially 90° to the plane of the outlet opening, said elbow shaped hydrant shoe having an improved interior configuration for minimizing flow loss, said improved configuration comprising said shoe having a cylindrical inlet passage extending from said inlet opening and a cylindrical outlet passage extending from said outlet opening, a part spherical chamber communicating with said cylindrical inlet passage and said cylindrical outlet passage, said part spherical chamber having a spherical center positioned above the axis of said cylindrical inlet passage and on the axis of said cylindrical outlet passage, a diverging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical inlet passage and said diverging transitional surface of rotation extending from a plane perpendicular to the cylindrical inlet passage and smoothly merging with said part spherical chamber at a tangential intersection with the same, and a converging transitional surface of rotation having a generally part frusto-conical shape with an axis generally parallel to the axis of said cylindrical outlet passage, said converging transitional surface of rotation extending smoothly from a tangential intersection with said part spherical chamber to a plane extending perpendicularly to an axis of said cylindrical outlet passage, said converging transitional surface merging smoothly with said diverging transitional surface.

4,227,545
VALVE FOR CONTROLLING THE FLOW OF HOT FLUIDS

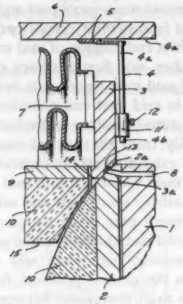
Rolf Augsburger; Horst Kuppka, and Helmut Zilling, all of Nuremberg, Fed. Rep. of Germany, assignors to Klein, Schanzlin & Becker AG, Frankethal, Fed. Rep. of Germany

Filed Jul. 27, 1977, Ser. No. 819,296

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2633808

Int. Cl.[2] F16K *49/00, 25/00*

U.S. Cl. 137—340 **10 Claims**



1. In a valve, particularly for controlling the flow of hot fluids in nuclear reactor plants or the like, the combination of a valve, body; a valving element installed in said body and movable between a plurality of positions including an open and a closed position; an annular sealing member; means for mounting said sealing member in the interior of said body for movement in a predetermined path into and out of a predetermined position in which said sealing member is centered relative to said valving element and sealingly engages the same, including a plurality of metallic supporting members extending substantially radially outwardly of said sealing member and secured to and movable with said sealing member, and deformable metallic connectors and means securing said connectors to said body and to said supporting member; and means for moving said sealing member in said path into and from said predetermined position with attendant deformation of said connectors as a result of movement of said supporting members with said sealing member.

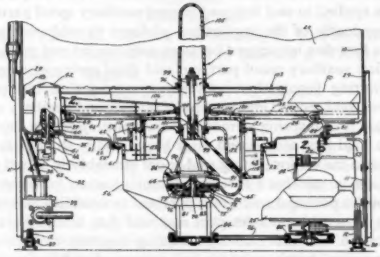
4,227,546
DISHWASHER FLUID CONTROL SYSTEM

Richard P. Bergeson, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed Sep. 6, 1978, Ser. No. 939,994

Int. Cl.[3] F16K *21/18*

U.S. Cl. 137—387 **8 Claims**



1. A dishwashing apparatus including a washing chamber, fluid inlet means for supplying fluid to said washing chamber, means for recirculating said fluid within said washing chamber, and sequential control means for controlling said apparatus during a cycle of operations including a plurality of fluid recirculation periods, wherein the improvement comprises: fluid level detecting means for energizing and deenergizing said fluid inlet means to admit a first quantity of fluid into said washing chamber under static conditions prior to initiation of each of said fluid recirculation periods of said cycle of operations; and circuit means included in said sequential control means for reenergizing said fluid inlet means to admit an additional quantity of fluid during the initial part of at least one of said fluid recirculation periods of said same cycle of operations while said fluid is being recirculated.

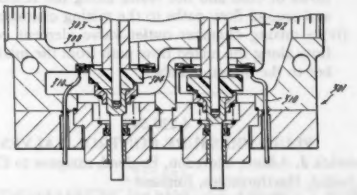
4,227,547
VALVE SAFETY INDICATING MEANS

Russell J. Cameron, Rochester, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Division of Ser. No. 910,492, May 30, 1978, abandoned, which is a continuation of Ser. No. 729,273, Oct. 4, 1976, abandoned. This application Feb. 12, 1979, Ser. No. 11,140

Int. Cl.[3] F15B *20/00*

U.S. Cl. 137—554 **4 Claims**



1. In combination with a poppet valve element movable toward and away from a seat, switch means comprising a spring-like conductive element mounted adjacent said seat and interposed between said element and seat, whereby said valve element will deflect said spring-like conductive element when it approaches said seat, and means connecting said conductive element to an electrical circuit.

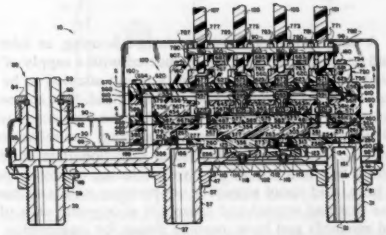
4,227,548
MULTIPLE CONTROL VALVE FOR MIXING FLUIDS

Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44114

Filed Feb. 27, 1979, Ser. No. 15,813

Int. Cl.[3] F16K *19/00*

U.S. Cl. 137—606 **32 Claims**



28. A valve for delivering cold water, hot water, or water at an intermediate temperature, comprising:

(a) base means unto which separate flows of hot water and cold water are supplied, the base means being operable to direct the cold water along a first flow path and the hot water along a second flow path;

(b) housing means secured to the base means, the housing means defining a cold water chamber in communication

with the first flow path, a hot water chamber in communication with the second flow path and a mixing chamber in communication with both the first and second flow paths;

(c) the housing means additionally defining an outlet chamber in communication with the cold and hot water chambers, and a mixed flow port defining a mixed flow path communicating the mixing chamber and the outlet chamber;

(d) flow restriction means disposed upstream of the mixing chamber in one of the first and second flow paths to proportion the relative flow rates of cold and hot water admitted to the mixing chamber;

(e) a plurality of valve elements disposed in the first, second and mixed flow paths, the valve elements being individually movable from a closed position where no waterflow can occur to an open position where waterflow is permitted, comprising:

(i) a cold water valve element controlling the flow of cold water along the first flow path to the cold water chamber;

(ii) a hot water valve element controlling the flow of hot water along the second flow path to the hot water chamber;

(iii) a mixing chamber inlet valve element controlling flows of cold and hot water along the respective first and second flow paths to the mixing chamber; and,

(iv) a mixing chamber outlet valve element controlling flow along the mixed flow path from the mixing chamber to the outlet chamber.

4,227,549

FLUID PRESSURE CONTROL VALVES

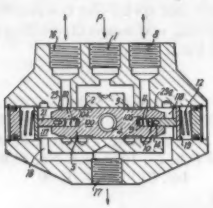
Frederick J. Adams, Clevedon, England, assignor to Cam Gears Limited, Hertfordshire, England

Filed Aug. 1, 1978, Ser. No. 930,065

Claims priority, application United Kingdom, Aug. 4, 1977, 32748/77

Int. Cl.[3] **F15B** *13/04*

U.S. Cl. 137—625.69 **1 Claim**



1. A fluid control valve comprising a housing, an inlet port in said housing adapted to be connected with a supply of pressurized fluid, a drain port in said housing adapted to be connected with a reservoir of low pressure fluid, first and second outlet ports in said housing adapted to be connected with a fluid actuated motor, a bore in said housing, a spool asssembly slidable in said bore in either axial direction from a neutral position, first and second end walls closing opposite ends of said bore, said spool assembly cooperating with said bore to define first and second end chambers at opposite ends of said spool assembly and bore, passage means for establishing fluid communication between each of said end chambers and said drain port regardless of the axial position of said spool assembly in said bore whereby fluid in said first and second end chambers is always at the same pressure as said drain port, passage means for establishing fluid communication between said first and second outlet ports and said first and second end chambers when said spool assembly is in said neutral position to connect said first and second outlet ports in fluid communication with the reservoir through said first and second end chambers, said spool assembly comprising a main spool part and first and second auxiliary spool parts, said main spool part and said first auxiliary spool part cooperating to define a first variable volume reaction chamber and said second auxiliary spool part and said main spool part cooperating to define a second variable volume reaction chamber, said first auxiliary spool part being axially movable relative to said main spool part to vary the volume of said first reaction chamber upon relative axial movement between said main spool part and first auxiliary spool part, said second auxiliary spool part being axially movable relative to said main spool part to vary the volume of said second reaction chamber upon relative axial movement between said main spool part and said second auxiliary spool part, said first auxiliary spool part extending axially outwardly from a first end surface of said main spool part into said first end chamber, said first auxiliary spool part and said first end surface of said main spool part being exposed to the reservoir pressure in said first end chamber when said spool assembly is in the neutral position and when said spool assembly is moved axially from the neutral position, said second auxiliary spool part extending axially outwardly from a second end surface of said main spool part into said second end chamber, said second auxiliary spool part and said second end surface of said main spool part being exposed to the reservoir pressure in said second end chamber when said spool assembly is in the neutral position and when said spool assembly is moved axially from the neutral position, first limiting means for limiting relative axial movement between said main spool part and said first auxiliary spool part and second limiting means for limiting relative axial movement between said main spool part and said second auxiliary spool part, said first and second limiting means establishing maximum and minimum volumes for said first and second variable volume reaction chambers, respectively, said spool assembly including passage means communicating fluid pressure between first outlet port and said first reaction chamber and passage means communicating fluid pressure between said second outlet port and said second reaction chamber, spring means for applying a biasing force in its entirety tending to retain said spool assembly in the neutral position, said spring means including a first spring element coacting between said main spool part and a first end portion of said first auxiliary spool part to urge said first auxiliary spool part toward a position in which said first variable volume reaction chamber has its maximum volume, a second spring element coacting between said main spool part and a first end portion of said second auxiliary spool part urging said second auxiliary spool part toward a position in which said second variable volume reaction chamber has its maximum volume, a third spring element coacting between said first end wall and a second end portion of said first auxiliary spool part to apply a portion of said biasing force to said first auxiliary spool part and a fourth spring element coacting between a second end portion of said second auxiliary spool part and said second end wall to apply a portion of said biasing force to said second auxiliary spool part, said spool assembly being urged toward the neutral position under the influence of only biasing forces applied to said first and second auxiliary spool parts and independently of the application of force to said main spool part, a first disc interposed between said second end portion of said first auxiliary spool part and said third spring element for transmitting forces therebetween, a second disc interposed between said second end portion of said second auxiliary spool and said fourth spring element for transmitting forces therebetween, said first and second discs being axially slidable in said bore, and means for sliding said spool assembly in a first axial direction in said bore to close communication between said first outlet port and said drain port and to establish communication between said inlet port and said first outlet port, the pressure in said first outlet port being communicated to said first reaction chamber and tending to expand said first reaction chamber against the force of said third spring element coacting between said first end wall and said first auxiliary spool part and in a second axial direction in said bore to close communication between said second outlet port and said drain port and to

establish communication between said inlet port and said second outlet port, the pressure in said second outlet port being communicated to said second reaction chamber and tending to expand said second reaction chamber against the force of said fourth spring coacting between said second end wall and said second auxiliary spool part, said bore including surface means for limiting axial movement of said first disc in said second direction and surface means for limiting axial movement of said second disc in said first direction.

4,227,550

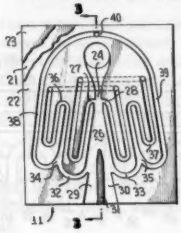
LIQUID OSCILLATOR HAVING CONTROL PASSAGES CONTINUOUSLY COMMUNICATING WITH AMBIENT AIR

Peter Bauer, Germantown, and Julian Lazrus, Bethesda, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.

Division of Ser. No. 356,416, May 2, 1973, abandoned. This application May 12, 1975, Ser. No. 576,713

Int. Cl.³ F15C *1/08*

U.S. Cl. 137—835 **9 Claims**



6. A fluidic oscillator of the type wherein a power stream of liquid is adapted to be issued alternately from first and second outlet passages at a submerged location in a liquid body in accordance with an oscillatory differential pressure applied between two control ports, said oscillator being characterized by means for continuously entraining ambient air in said power stream, said means comprising:

means responsive to power stream flow through said first outlet passage for flowing air through one of said control ports, and to the absence of power stream flow through said first outlet passage for blocking air flow to said one control port; and

means responsive to power stream flow through said second outlet passage for flowing air through the other of said control ports, and to the absence of power stream flow through said second outlet passage for blocking air flow to said other control port.

4,227,551

TUBE BANKS

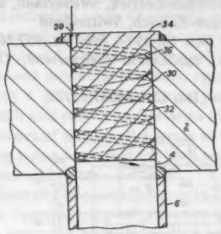
Ronald J. Hawkins, Morden, and Anthony E. Ruffell, Maidenhead, both of England, assignors to Babcock & Wilcox, Limited, London, England

Filed Aug. 3, 1978, Ser. No. 930,693

Int. Cl.³ F16D *1/02*

U.S. Cl. 138—40 **1 Claim**

1. A tube bank having a tube plate with inner and outer faces, bores penetrating the tube plate and tubes connected to the bores adjacent the inner face of the tube plate, in which each bore is obturated with a flow restricting device comprising a cylindrical plug having a cylindrical surface arranged to be a tight fit within the tube plate bore and having an outwardly directed flanged head portion formed with an aperture and seal welded to the outer face of the tube plate, a spiral groove formed in the cylindrical surface of the cylindrical plug connecting the aperture in the flanged head portion with the interior of the respective tube, the spiral groove and the aperture together forming a passage having a length in excess of the bore diameter and being dimensioned in conjunction with the



passage cross-sectional area to give rise to a required flow restriction.

4,227,552

WEAVING MACHINE HAVING AN AIR DUCT FOR CLEANING PURPOSES

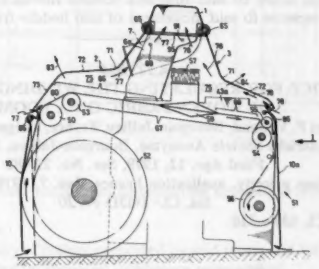
Heinz Baumann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 13, 1978, Ser. No. 959,514

Claims priority, application Switzerland, Nov. 17, 1977, 014037/77

Int. Cl.² D03D *49/00*

U.S. Cl. 139—1 C **11 Claims**



1. In combination with a weaving machine having a frame having a picking side and a catching side and means for moving a weft yarn through a predetermined weft path in a weaving plane from said picking side to said catching side;

an air duct extending parallel to said path above said weaving plane,

a shedding mechanism below said air duct between a warp beam end and a cloth beam end of said machine,

at least one flap secured to said duct to cover at least a part of said weaving plane, and

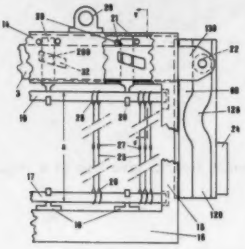
removable bearer members mounted on said frame below said air duct, each said member being disposed at a respective one of said picking side and said catching side to move said air duct.

4,227,553

WEAVING MACHINE WITH HEDDLE FRAMES

Rudolf Schwarz, Horgen-Zuerich, Switzerland, assignor to Staeubli, Ltd., Horgen-Zuerich, Switzerland

Filed Oct. 18, 1978, Ser. No. 952,601
Claims priority, application Switzerland, Oct. 20, 1977, 12781/77
Int. Cl.[2] D03D *13/00*
U.S. Cl. 139—82 8 Claims



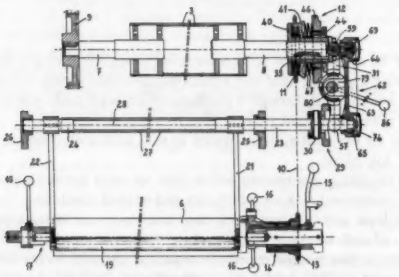
1. A weaving machine having a shed forming means thereon comprising:
frame means;
a heddle frame movably supported on said frame means;
first and second spaced and parallel thread rail means mounted on said heddle frame;
at least one heddle connected to and extending between said first and second thread rail means;
first means for effecting a change in the spacing between said first and second thread rail means in response to a movement of said heddle frame, said first means including control means, separate from said shed forming means, secured to said frame means for controlling the relative spacing between said first and second thread rail means; and
connecting means for operatively connecting said control means to one of said first and second thread rail means for causing said one of said first and second thread rail means to move selectively at least one of toward and away from the other of said first and second thread rail means in response to said movement of said heddle frame.

4,227,554

DEVICE FOR REGULATING THE WINDING TENSION OF WOVEN FABRIC ON A LOOM

Michel F. Volland, Bourgoin-Jallieu, France, assignor to Saurer-Diederichs Societe Anonyme, Bourgoin-Jallieu, France

Filed Apr. 12, 1979, Ser. No. 29,480
Claims priority, application France, Jun. 7, 1978, 78 17704
Int. Cl.[2] D03D *49/20*
U.S. Cl. 139—310 10 Claims



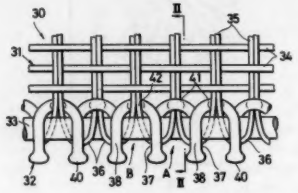
1. A device for regulating the winding tension of woven fabric on a loom having a winding system comprising a driven tension roller, a storage roller spaced from and parallel with the tension roller and an endless chain connecting the rollers whereby the storage roller is driven by the tension roller, the device comprising a follower for contacting a roll of fabric wound around the storage roller, a rotary cam operatively associated with the follower so as to be movable therewith in accordance with variation in the diameter of the roll of fabric, a friction mechanism coaxial and rotatable with the tension roller, an oscillating lever bearing at opposed ends on the friction member and the profile of the cam whereby the driving torque of the storage roller is modified according to the diameter of the roll of fabric.

4,227,555

WOVEN SLIDE FASTENER STRINGER

Masaatsu Ofusa, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,566
Claims priority, application Japan, Sep. 26, 1977, 52/115362
Int. Cl.[2] A44B *19/10*
U.S. Cl. 139—384 B 4 Claims



1. A slide fastener stringer comprising:
(a) a woven stringer tape including a plurality of warp threads and a weft thread interlaced in double picks with said warp threads, said weft thread having a plurality of loops disposed along a longitudinal edge of said stringer tape and each extending from adjacent two of said double picks;
(b) a core thread extending warpwise through said loops in engagement therewith; and
(c) a filamentary coupling element having a plurality of turns spaced longitudinally of the tape, each of said turns including a pair of spaced limbs between which said core thread extends, and a coupling head disposed between said limbs, said element further having a plurality of connecting portions each extending between adjacent two of said limbs which are located on one side of said core thread, each of said double picks having a portion extending around one of said connecting portions and between said one connecting portion and said core thread, and blending into adjacent two of said loops.

4,227,556

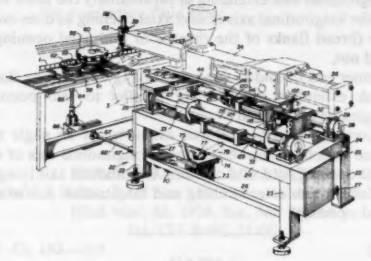
METHOD AND APPARATUS FOR SLUSH MOLDING ARTICLES OF FOOTWEAR

Eric J. Hurst, Trenton, and Hugh G. MacAulay, Batawa, both of Canada, assignors to Bata Shoe Company, Inc., Belcamp, Md.

Division of Ser. No. 925,842, Jul. 18, 1978. This application Nov. 29, 1978, Ser. No. 964,750
Claims priority, application Canada, Aug. 22, 1977, 285219
Int. Cl.[3] B29F *5/00*
U.S. Cl. 141—137 5 Claims

1. An apparatus for filling the heel cavities of footwear molds moving continuously along a rectilinear path of travel comprising a stationary frame adjacent to said path of travel; a carriage slidably mounted on said frame for movement towards and away from said path of travel; an injection unit

rotatably mounted on said carriage for movement with the carriage towards and away from said path of travel; nozzle means on the discharge end of said injection unit for dispensing thermoplastic material into the heel cavity of a mold; first drive means for rotating said injection unit in synchronism with a mold during a heel filling operation; a shaft for rotating the



injection unit; and cam means engageable by said injection unit for causing the carriage to move towards and away from said path of travel, wherein the first drive means includes a drive train connected at one end to a conveyor and at the other end to said shaft, whereby the nozzle means moves in a straight line path of travel over a mold during the heel filling operation.

4,227,557

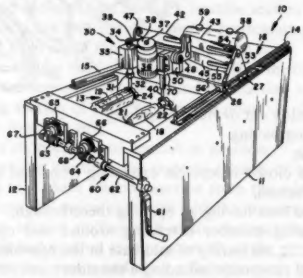
REPLICATION APPARATUS

Donald L. Allen, Northfield, Minn., assignor to Don Allen, Inc., Northfield, Minn.

Filed Dec. 4, 1978, Ser. No. 966,093

Int. Cl.³ B27C 7/06

U.S. Cl. 142—7 **4 Claims**



1. Apparatus for replicating three-dimensional articles comprising:

(a) base frame means, first and second holder means secured to said base frame means for retaining the article to be replicated and a blank workpiece respectively, and laterally spaced opposed rail means secured to said base frame means for supporting a cutter assembly carriage thereon;

(b) said first and second holder means each including axially aligned opposed gripping means with said first and second holder means being spaced apart a predetermined distance along parallelly disposed axes, said gripping means being journaled within said base frame means for axial rotation about said parallel axes, and means for rotating said opposed gripping means in unison, one with the other;

(c) a longitudinally movable cutter assembly comprising a cutter head, motor means for driving said cutter head about a certain cutting axis, stylus means spaced from said cutter head and having a contact tip for making contact with the surface of said article to be replicated, said contact tip being spaced from the axis of said cutter head by a distance equal to said predetermined distance, and a parallelogram working frame supporting said cutter assembly and including a pair of opposed mounting brackets slidably disposed on said opposed rail means;

(d) first and second parallelly disposed transverse shafts secured to said mounting brackets, each said transverse shaft having a pair of rocker arms journably mounted thereon, each said pair of rocker arms forming upper and lower members of said parallelogram working frame, said rocker arms being journaled for both pivotal and slidable motion upon said transverse shafts;

(e) a pair of laterally disposed bell cranks journably coupled to laterally opposed ends of said pairs of rocker arms to form one generally vertical end of said parallelogram working frame and with said laterally disposed bell cranks supporting a cross-member having a surface upon which said cutter assembly is supported, said cutter assembly being arranged for generally vertical up-and-down reciprocal motion with said rocker arms; and

(f) a pair of laterally opposed counterweight supporting brackets secured to said pairs of rocker arms in opposed relationship to said bell cranks and supporting a counterweight substantially balancing the weight of said cutter assembly.

4,227,558

APPARATUS FOR SIMULATING A WOODGRAIN FINISH

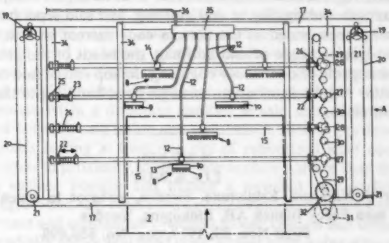
Robert E. Bates, 161 Portland Rd., Remuera, Auckland, New Zealand

Filed Dec. 22, 1978, Ser. No. 972,457

Claims priority, application New Zealand, Dec. 22, 1977, 186093

Int. Cl.³ B27C 9/00

U.S. Cl. 144—2 R **3 Claims**



1. A simulated woodgrain embellishing apparatus, comprising:

(a) a frame;

(b) a plurality of rollers supported by said frame and forming a horizontally disposed workpiece support bed;

(c) a carriage substantially horizontally disposed adjacently over said workpiece support bed;

(d) a plurality of transverse burner head supports mounted on said carriage transversely one behind the other relative to the path of said workpiece support bed, each of said burner head supports being longitudinally reciprocable within support bearings mounted on said carriage;

(e) cam means operatively connected to each of said burner head supports to effect longitudinal reciprocal movement of said burner head supports;

(f) means for rotating said cam means to effect said reciprocal movement of said burner heads supports;

(g) burner heads mounted, at least one to each of said burner head supports, in transverse staggered relationship to each other, each burner head having a plurality of transversely disposed and adjacently spaced apart nozzles spaced adja-

cently upward of and directed toward said workpiece support bed;

(h) means for fueling said burner heads to form, upon ignition, a naked flame issuing from each nozzle to scorch an upper surface of a workpiece passing through the apparatus on said workpiece support bed to produce a simulated woodgrain appearance.

4,227,559

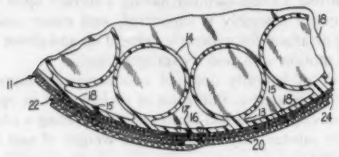
DUAL ATTITUDE GOLF BAG

Marlin H. Stroman, 142 Phillips, Clawson, Mich. 48017

Filed Jun. 4, 1979, Ser. No. 44,984

Int. Cl.[3] A63B *55/00*

U.S. Cl. 150—1.5 R **2 Claims**



1. Improvement in a dual attitude golf bag for carrying a set of golf clubs having an in-use attitude for golf playing and a space saving flat-lying attitude for storage and transport, said improvement comprising a flexible one-piece extruded core for said golf bag having the same two attitudes as the latter and consisting of a normally flat-lying shell and a plurality of side by side separator tubes integrally joined to said shell, the set of golf clubs, in each of the two attitudes of said core, being individually contained in said separator tubes, said core, in the in-use attitude of said golf bag, having a cylindrical form in which said separator tubes are disposed in side by side substantially rigid abutment to each other so as to impart compressive strength and rigidity to said golf bag, and said separator tubes being open ended at the bottom ends thereof so that, in the flat-lying attitude of said golf bag, the heads of the golf clubs are capable of commonly engaging the top end of said core for better weight distribution, managing and handling of the set of golf clubs.

4,227,560

LOCK NUT

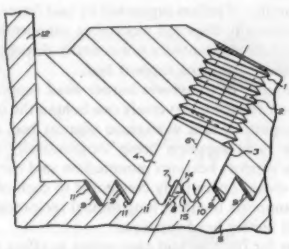
Bertil Karlsson, Eskilstuna, Sweden, assignor to Ingenjörsfirman Percy Blanck AB, Lidköping, Sweden

Filed Nov. 23, 1977, Ser. No. 854,498

Claims priority, application Sweden, Dec. 2, 1976, 7613515

Int. Cl.[2] F16B *39/04*

U.S. Cl. 151—24 **5 Claims**



1. A lock nut for attachment to an exteriorly threaded member, said lock nut comprising:

a nut having a threaded axial opening adapted to be threaded onto an exteriorly threaded member;

said nut having therein an oblique bore extending from said axial opening;

a locking pin positioned in said oblique bore, said locking pin having an inner end which is shaped to fit within the threads of the exteriorly threaded member;

said oblique bore and said locking pin having a common longitudinal axis extending at substantially the same angle to the longitudinal axis of said axial opening as does one of the thread flanks of the threads of said axial opening of said nut;

said inner end of said locking pin having at least one thread flank extending substantially parallel to said common longitudinal axis; and

said common longitudinal axis extending at an angle to a plane which is transverse to said longitudinal axis of said axial opening, and said common longitudinal axis lying on a plane which extends along said longitudinal axis of said axial opening.

4,227,561

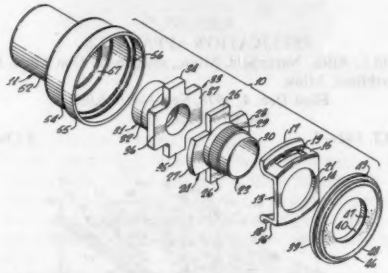
SEALED FASTENER

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., Los Angeles, Calif.

Filed May 5, 1978, Ser. No. 903,163

Int. Cl.[2] F16B *39/00, 37/14*

U.S. Cl. 151—41.74 **10 Claims**



1. A sealed nut device comprising

a housing having

a base

and a closed receptacle extending from said base in one direction,

said base having an opening therethrough,

a sealing member extending around said opening and facing outwardly of said base in the opposite direction,

said receptacle including a shoulder overlying the marginal portion of said base on said one side thereof

and a flange overlying the marginal portion of said base on the opposite side thereof, said sealing member including a first annular portion intermediate said flange and said opposite side of said base,

whereby said base is connected to said receptacle and is sealed relative thereto,

a second annular portion adjacent and radially inwardly of said first annular portion,

said second annular portion projecting outwardly of said opposite side beyond said flange for engagement with a workpiece,

and a third annular portion adjacent said second annular portion and extending radially inwardly therefrom to an inner edge adjacent said opening,

said third annular portion being recessed beneath said second annular portion, said second annular portion being thicker than either of said first annular portion and said third annular portion,

and nut means, said nut means including

a threaded portion in said housing,

and a sleeve extending through said opening and projecting beyond said base in said opposite direction,

said sleeve being adapted to be extended through an opening in a workpiece and being bendable to form a flange for cooperating with said base to retain said housing and nut means to such a workpiece and to cause said sealing member to engage said workpiece for precluding fluid flow.

4,227,562

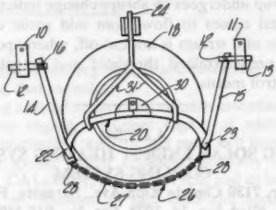
ROAD TRACTION APPARATUS

Reginald J. Adair, P.O. Box 126, Utica, Mich. 48087

Filed Mar. 13, 1979, Ser. No. 20,084

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—214 3 Claims



1. Vehicular road traction apparatus for feeding an anti-skid element between a tire of the vehicle and the surface of the road comprising,

an anti-skid endless chain having a traction section for lying between a tire and the road and a recirculating section leading from aft of the tire to fore of the tire;

an arcuate tubular conduit leading from aft of the tire to fore of the tire movably enclosing and conducting said recirculating section of said chain from a point aft of a tire to a point fore of a tire;

means for supporting said conduit in position;

rotation of the tire over the traction section of said chain pulling said chain traction section from the conduit at a point fore of rotation of the tire with the movement of said traction section pulling said chain recirculating section through said conduit from a point aft of the tire;

said supporting means including a first pivot pin mountable on a vehicle adjacent a tire;

an arm having an end movably swung on said first pivot pin and an end fixed to said conduit;

a second pivot pin mountable on a vehicle adjacent a tire,

a second arm having an end movably swung on said second pivot pin and an end fixed to said conduit;

said first and second arms being fixed to said conduit at points spaced apart;

a cable connected to said conduit for raising said conduit from the position between a tire and the road to a position away from a tire where said chain is not fed under the tire and for lowerng said conduit to the position where said chain is fed under the tire;

said conduit being separated mid-way in its length and a hinged joint interconnecting said separated portions of said conduit;

said cable being attached to said conduit on one side of said hinged joint with the hinged joint transferring raising and lowering motion from said cable to the conduit on the other side of said hinged joint.

4,227,563

BEAD CONSTRUCTION FOR A HEAVY DUTY PNEUMATIC TIRE

Karl Grosch, Roetgen; Paul Moitzheim, and Gert Schloesser, both of Aachen, all of Fed. Rep. of Germany, assignors to Uniroyal GmbH, Aachen, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,231

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715734

Int. Cl.³ B60C *15/00, 9/02*

U.S. Cl. 152—354 R 10 Claims

1. A heavy-duty pneumatic tire for mounting on a 15° steep-shouldered rim comprising, in cross-section, a sidewall having an inside surface portion and an outside surface portion, a bead defined between said inside and said outside surface portions, said bead being formed with a heel at said outside surface portion and a toe-edge at said inside surface portion to define a seat, said bead including a bead core having an elongated hexagonal, cross-sectional configuration of unequal long sides oriented parallel to the seat and having a predetermined width when measured in a direction parallel to said seat, a carcass disposed between said inside and said outside surface portions, said carcass having at least one ply of rubberized steel cord fabric closer in proximity to the inside surface portion than the outside surface portion and having a terminal end portion turned up around said bead core a predetermined distance from said carcass and substantially parallel to said carcass and terminating radially above said bead core, a bead reinforcing strip of steel cord extending from the heel and having a terminal end radially above the terminal end of the carcass turnup, a tread forming a crown-like cover on the carcass, a reinforcement belt disposed between said tread and said carcass, said reinforcement belt being formed of rubberized steel cord, and a rubber filler assembly disposed between said inside and said outside surface portions and extending approximately from the bead core toward the tread, said filler assembly comprising an apex strip of hard rubber compound contacting said bead core and having converging side portions extending radially of and from said bead core, said apex strip having a height when measured in a direction perpendicular to said seat of no more than 1.5 times the width of said bead core and, together with the bead core, forming a rigid unit with said bead core, said bead core including rubberized steel wires extending perpendicular to axial planes of the tire and concentrically with respect to each other to form a rigid bead area providing a relatively short shear stress path, said filler assembly further including cushion elements formed of a soft rubber compound different from the rubber compound of said apex strip and being strongly adherent to steel and having high rebound elasticity, the terminal end of the carcass turn-up and the terminal end of the bead reinforcing strip being embedded in the

cushion elements whereby the bead area is endowed with elastic rebound characteristics.

4,227,564

CURTAIN TRACK WITH TRAVERSE CORD

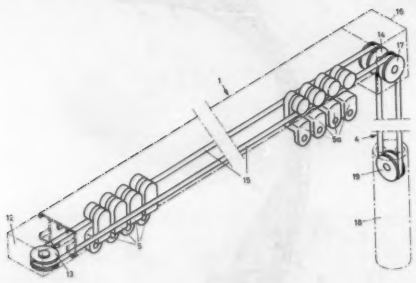
Konrad Bratschi, Haldenweg 29, 3074 Muri, Switzerland, assignor to K. Bratschi and Silent Gliss, both of Muri, Switzerland

Filed Jan. 29, 1979, Ser. No. 7,520

Claims priority, application Switzerland, Jan. 27, 1978, 938/78

Int. Cl.³ A47H *5/00*

U.S. Cl. 160—345 **11 Claims**



1. Curtain track with traverse cord and longitudinally displaceable curtain hangers, wherein

the hangers are frictionally engaged with the cord which is guided lengthwise in at least one channel of the track,

the hangers bearing upon the track indirectly via the cord,

the relationships being such that, upon actuation of the traverse cord the frictional engagement by the cord produces entrainment of the hangers, and, upon exceeding of the frictional engagement force the cord slips relative to the curtain hangers.

4,227,565

FLOW CUT-OFF METHOD AND APPARATUS FOR FOUNDRY INSTALLATIONS

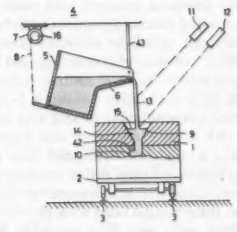
Gerard A. Lavanchy, Prilly-Lausanne; Marc-Henry Rossier, Epalingues, and Fritz Mezger, Muntelier, all of Switzerland, assignors to Maschinenfabrik & Eisengiesserei Ed. Mezger AG, Berne, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,753

Claims priority, application Switzerland, Sep. 5, 1977, 10808/77

Int. Cl.³ B22D *46/00*

U.S. Cl. 164—155 **9 Claims**



1. A control system for a casting installation comprising a casting ladle containing molten metal for filling a mold; at least one mold having an inner cavity and a sprue cup thereon, said mold being filled by a stream of metal which falls from said casting ladle into said sprue cup, thus forming in said sprue cup an accumulation of metal with a free surface while flowing from said sprue cup towards said inner cavity, a first detector means for measuring the level of said surface and for generating a first analog signal corresponding to said level, a second detector means for measuring the width of said stream and for generating a second analog signal corresponding to said width; an electronic circuit means having a first input connected to said first detector means for receiving said first analog signal, a second input connected to said second detector means for receiving said second analog signal and an output; flow cut-off control means for causing said casting ladle to cease filling said sprue cup; and a connection means disposed between said output and said flow cut-off control means, said electronic circuit means comprising differentiation means, summing means and amplification means, said electronic circuit means processing both of said analog signals and forming a filling control signal from both of said processed analog signals, said filling control signal representing the flow rate of molten metal through said sprue cup, said filling control signal having an abrupt fluctuation when the flow rate of molten metal through said sprue cup undergoes an abrupt change indicating that said molten metal ceases to flow from said sprue cup into said cavity while said stream is not cut-off, whereupon said signal exceeds a predetermined threshold and actuates said flow cut-off control means.

4,227,566

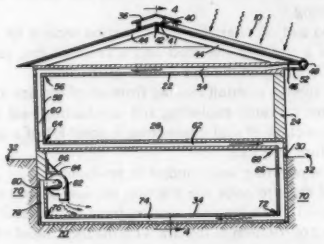
BUILDING SOLAR ENERGY HEATING SYSTEM AND COOLING SYSTEM

John Stilber, 7130 Captain Kidd Ave., Sarasota, Fla. 33581

Filed Jun. 14, 1978, Ser. No. 915,359

Int. Cl.³ F28D *21/00*; F24J *3/02*

U.S. Cl. 165—1 **11 Claims**

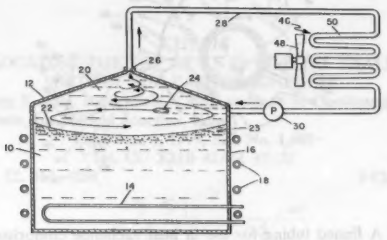


1. A built-in solar combination heating and cooling system for a building having a subfloor, walls, one or more ceilings, and a roof having a ridge and eaves, the southerly surface of said roof being exposed generally in the direction of maximum solar radiation, said system comprising a first heat exchange means and a second heat exchange means, said first heat exchange means comprising a sealed connection and a plurality of air-filled tubular roof solar panels secured to said roof, connected to said sealed connection, and extending from ridge vents along said ridge to said sealed connection, said panels have openings along said ridge for allowing air to enter or exit said panels, said second heat exchange means comprising in continuous sealed interconnected relationship cored air-filled slabs comprising said ceilings, a plurality of hollow air-filled blocks comprising said walls, a cored air-filled slab comprising said subfloor, an opening from said second heat exchange means into the interior of said building, and an air blower interposed between said opening and the interior of said building, said air blower being adapted to transfer air from said second heat exchange means into said building, said first heat exchange means being connected at said sealed connection to said second heat exchange means.

4,227,567
INTERMEDIATE TEMPERATURE, HEAT STORAGE AND RETRIEVAL SYSTEM

Norman D. Greene, Del Mar, Calif., assignor to Kohler Co., Kohler, Wis.

Filed Dec. 21, 1978, Ser. No. 971,869
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[3] F28D *21/00*
U.S. Cl. 165—1 18 Claims



1. The method of storing energy and retrieving such stored energy as heat, that includes

(a) providing a liquid system that consists essentially of a salt melt lower region, an upper region of additive liquid which is immiscible with the salt melt, said liquid selected from the group which consists essentially of THERMINOL, CALORIA, SANTOWAX, and di-butyl phthalate, and an emulsion of said melt and additive liquid intermediate said upper and lower regions,

(b) effecting latent heat transfer from the melt to the additive liquid within the emulsion, and transferring heat from the additive liquid,

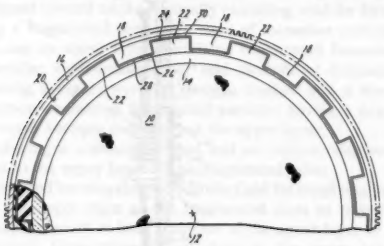
(c) maintaining active flowing movement of the emulsion to enhance said latent heat transfer, and which results in formation of salt crystals, and

(d) gravitating said crystals downwardly in the melt away from the emulsion.

4,227,568
DRIVE SYSTEM FOR A CERAMIC REGENERATOR

Charles A. Knapp, Grosse Pointe Woods, Mich., and Gary L. Boyd, Tempe, Ariz., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 5, 1979, Ser. No. 17,291
Int. Cl.[3] F28D *19/00*
U.S. Cl. 165—8 3 Claims

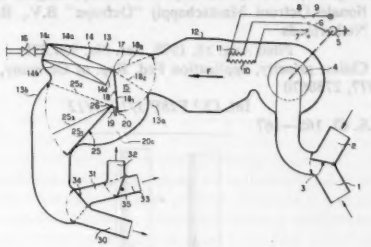


1. A regenerator construction comprising a ceramic cylindrical core having axial gas flow passages therein, a ring gear surrounding said core, said ring gear being radially spaced with respect to said core to define an annular space therebetween, and an elastomeric drive means situated in said space, said drive means comprising a plurality of elastomeric drive lugs bonded to the inner surface of said ring gear at tangentially spaced locations, a plurality of external elastomeric drive lugs bonded to the external peripheral surface of said core at tangentially spaced locations, the drive lugs on said ring gear being spaced to define tangentially arranged spaces therebetween, the lugs on said core registering with said spaces thereby establishing a compression reaction drive system for transmitting drive forces between said ring gear and said core.

4,227,569
AIR CONDITIONING INSTALLATION

Jean-Jacques Wattin, Nogent-le-Rotrou, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Aug. 8, 1978, Ser. No. 931,878
Claims priority, application France, Aug. 11, 1977, 77 24786
Int. Cl.[3] G05D *23/00*
U.S. Cl. 165—35 7 Claims



1. An air conditioning installation for an enclosure, such as the passenger space of a motor vehicle, comprising

heating and/or cooling apparatus having a heating and/or cooling capacity;

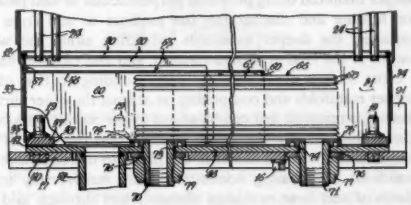
first control means, for said heating and/or cooling capacity of said apparatus, for providing said capacity at a preset value which is substantially continuously adjustable between first and second limit values; and

extra control means, for said heating and/or cooling capacity of said apparatus, for imparting to said capacity said first or second limit value without modifying said preset value of said first control means when active, and for imparting to said capacity said preset value of said first control means when disconnected.

4,227,570
HEAT EXCHANGE STRUCTURE

Donald R. Crews, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1979, Ser. No. 95,195
Int. Cl.[3] F28F *9/26*; F01P *11/08*
U.S. Cl. 165—67 15 Claims



1. In a heat exchange structure comprising a radiator (10) having a downstream tank (20), means for admitting heated fluid to the radiator (10) wherein said fluid flows through the radiator (10) to the downstream tank (20), said downstream tank (20) has an opening (38) in one side thereof, baffle means

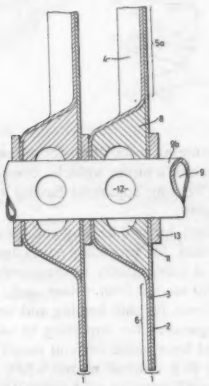
(55) mounted in said downstream tank (20) for diverting flow from the radiator through said baffle means (55), and oil cooler (66) mounted in said downstream tank (20) in close association with said baffle means (55) whereby said flow through said baffle means (55) flows over said oil cooler (66), a plate (46) sealingly attached over said opening (38) in said downstream tank (20), and an outlet (52) in said downstream tank (20) downstream from said baffle means (55) and oil cooler (66) for exiting the fluid from said downstream tank (20).

4,227,571

PLATE HEAT EXCHANGER

Jan Tjaden, Durach, Fed. Rep. of Germany, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Aug. 18, 1978, Ser. No. 934,895
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738670
Int. Cl.³ F28F *3/10, 3/12*
U.S. Cl. 165—167 6 Claims



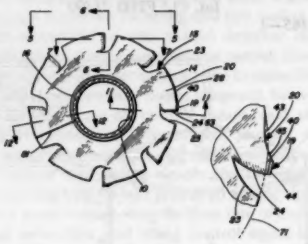
1. A plate heat exchanger, comprising heat exchange elements through which a medium flows, each heat exchange element consisting of two opposed thin metal plates, each plate coated with a sealing adhesive material on the surface thereof contacting the opposed plate and the abutting areas of the plates thereby being bonded together, at least one of said two plates being deep-drawn to form a plurality of parallel shallow passages therein and, on opposed ends of said passages, a deeper manifold being provided perpendicular to said passages for feeding and discharging the medium to and from said passages, the deeper menifolds extending along the whole length of the heat exchange element, and end closures having a cross section approximately corresponding to that of the deeper manifolds and comprising on at least the outer surfaces thereof, a material that can be sealed to the coated sides of the plates, the end closures being inserted into the ends of said deeper manifolds and sealed to the plates to thereby close said manifolds, distributing conduits running transversely to the plates of said heat exchange elements and through said end closures, said distributing conduits opening into channels which are provided in the end closures such that the medium can flow from one distributing conduit through an associated end closure into one of said manifolds connected to the ends of said passages and then through said passages to the other opposed manifold and into another distributing conduit in an associated end closure.

4,227,572

FINNED TUBING

Courtney S. Harlan, Medina, Ohio, assignor to Seton-Scherr, Inc., Medina, Ohio

Filed Mar. 27, 1978, Ser. No. 890,369
Int. Cl.³ F28F *1/36*
U.S. Cl. 165—184 7 Claims



1. A finned tubing for use in heat exchange comprising, a cylindrical tube,

a strip of material helically disposed about said tube to form a series of helically disposed fin convolutions,

a plurality of said fin convolutions having generally radially outwardly extending webs defining serrations therebetween along the outer periphery of said fin convolutions,

the sides of said webs extending inwardly of said periphery and defining the opposed legs of said serrations,

a laterally extending flange disposed on the periphery of each web adjacent at least one of said sides,

said flange being wider than the general thickness of said fin convolution adjacent said flange,

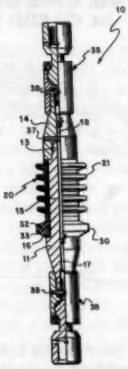
said one side having faces which taper to a terminal edge so as to provide a relatively sharp edge on at least one leg of each serration inwardly of said flange.

4,227,573

REINFORCED SEAL UNIT FOR PUMPDOWN PISTONS OR WELL SWABS

Joseph L. Pearce, Dallas; Thomas W. Ray, Plano; Donald F. Taylor, Dallas, and John H. Yonker, Carrollton, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 16, 1978, Ser. No. 961,139
Int. Cl.³ E21B *33/12*
U.S. Cl. 166—153 15 Claims



1. A piston for through a flowline (TFL) servicing of wells, comprising:

a. mandrel means;

b. a seal unit supported on the exterior of the mandrel means;

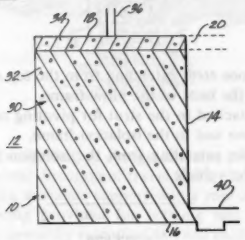
c. an annular fin extending from the seal unit for engagement with the interior wall of the flowline;
d. the annular fin having an interior portion comprising a wire mesh molded within an elastomer;
e. the cross section of the interior portion conforming to the cross section of the annular fin; and
f. means for connecting the piston to other well tools.

4,227,574

LOCATING THE TOP OF AN IN SITU OIL SHALE RETORT FOR EASE OF IGNITION

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jan. 8, 1979, Ser. No. 1,605
Int. Cl.[2] E21B *43/24, 43/26*
U.S. Cl. 166—259 **9 Claims**



7. A method of forming a combustion zone within an in situ oil shale retort in a subterranean formation containing oil shale and having a plurality of strata of formation extending through a retort site, at least one stratum of formation having a higher average kerogen content than the average kerogen content of formation within the retort site, the method comprising the steps of:

excavating at least one vertically extending void within the retort site and leaving a remaining portion of unfragmented formation within the retort site, said vertically extending void extending through such a stratum of formation having a higher average kerogen content;

explosively expanding the remaining portion of unfragmented formation within the retort site, including such a stratum of formation having a higher average kerogen content toward such a vertically extending void for forming a fragmented permeable mass of formation particles having an upper layer containing fragmented formation particles substantially from said stratum of formation having a higher average kerogen content and a lower portion containing fragmented particles having a lower average kerogen content than the upper layer;

introducing a combustible fluid and an oxygen-containing gas to the upper layer of the fragmented mass;

igniting and burning the combustible fluid for supplying heat to the upper layer of the fragmented mass to raise the temperature of at least a portion of the upper layer to an ignition temperature of oil shale in the upper layer, thereby igniting the formation particles in the upper layer for establishing a combustion zone in the fragmented mass; and

introducing an oxygen containing gas to the fragmented mass and withdrawing an off gas from the lower portion of the fragmented mass for maintaining the combustion zone and advancing the combustion zone downwardly through the fragmented mass.

4,227,575

RESERVOIR STABILIZATION BY TREATING WATER SENSITIVE CLAYS

Daryl W. Nooner, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 30, 1978, Ser. No. 920,881
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 **3 Claims**

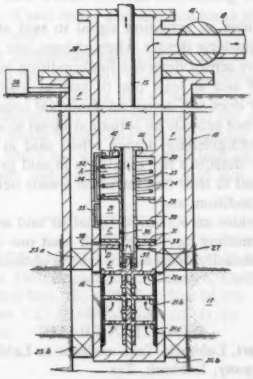
1. A method of altering the matrix of a hydrocarbon-bearing formation having present therein montmorillonite clays, comprising the steps of introducing into said formation via a wellbore penetrating said formation a heated aqueous solution of an amide selected from the group consisting of urea and formamide, continuing injection of said solution until said matrix is heated to a minimum temperature of about 260° C. for a desired radial distance from said wellbore, whereby said matrix is stabilized by mineralogically altering said montmorillonite clays.

4,227,576

METHOD FOR CLEANING A HELICAL SPRING SAND SCREEN

Reynaldo Calderon, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 16, 1979, Ser. No. 12,934
Int. Cl.[3] E21B *37/08, 43/08*
U.S. Cl. 166—312 **8 Claims**



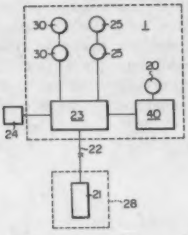
1. A method for cleaning a helical spring sand screen which has a reciprocal valve means connected to the helical spring sand screen for contracting the helical spring for filtering sand from liquid from a producing well for producing sand-free liquid through a production tube and for expanding the helical spring sand screen for backwashing liquid therethrough for cleaning thereof comprising,

(a) ceasing flow from the production tube,
(b) injecting high pressure liquid into the recipocal valve means for expanding the helical spring sand screen, and
(c) injecting more high pressure liquid into the helical spring sand screen for cleaning thereof.

4,227,577
FIRE-EXTINGUISHING SYSTEM

Makoto Iida, Tokyo, Japan, assignor to Security Patrols Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 726,832, Sep. 27, 1976, abandoned. This application Apr. 12, 1978, Ser. No. 895,605
Claims priority, application Japan, Jul. 26, 1976, 51-88810; Mar. 30, 1978, 53-36039
Int. Cl.[2] A62C *37/04*
U.S. Cl. 169—61 10 Claims



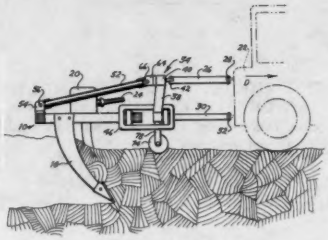
1. A fire extinguishing system coupled with a guarding system for protecting the same region, said guarding system including at least one intrusion sensor positioned in said region for providing an abnormal condition signal when a person is in said region, said fire extinguishing system comprising:
(a) at least one fire sensor for monitoring a condition indicative of a fire and for providing a fire signal upon the sensing of the condition;
(b) at least one fire extinguishing device;
(c) at least one manually operable means for operation by a person to activate said fire extinguishing device; and
(d) logic conduit means coupled to said at least one intrusion sensor, said at least one fire sensor, and said at least one manually operable means wherein said logic circuit means:
(i) provides an actuation signal to said at least one fire extinguishing device when at least one of said at least one fire sensor detects a fire condition in said protected region and at least one of said at least one intrusion sensor does not detect an abnormal condition;
(ii) does not provide an actuation signal to said at least one fire extinguishing device when said at least one fire sensor detects a fire condition in said protected region and said at least one intrusion sensor detects an abnormal condition; and
(iii) provides an actuation signal to said at least one fire extinguishing device when at least one of said at least one manually operable means are actuated.

4,227,578
ISOLATION FRAME

Henry W. Hurt, Lubbock, Tex., assignor to Lubbock Manufacturing Company, Lubbock, Tex.

Filed Jun. 11, 1976, Ser. No. 695,083
Int. Cl.[3] A01B *13/08, 15/04, 35/32, 59/042*
U.S. Cl. 172—40 4 Claims

1. In a vibrating earth working device to be drafted behind a vehicle having
a. a plow frame having
(i) a forward most member and
(ii) a rear beam,
b. a plurality of ripper plows on said plow frame,
c. said plows adapted to be moved in a direction of draft, and
d. a vibrator on the plow frame,
e. said vibrator being means for vibrating the plow frame in a horizontal direction normal to the direction of draft;
f. the improved structure comprising:
g. a planar isolation frame located in a vertical plane which is normal to the direction of draft,
h. two draft links interconnecting the plow frame to the isolation frame,
j. said draft links pivoted about vertical pivots to the isolation frame forward thereof, and
k. said draft links pivoted about vertical pivots to the plow frame behind the forward most member thereof,

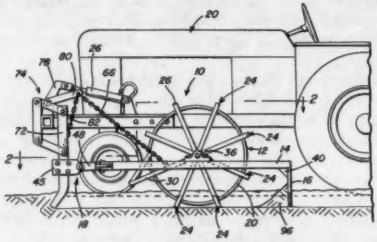


m. at least one strut extending from the top of the isolation frame to the back of the plow frame,
n. means attached to the strut for pivoting said strut to the plow frame and to the isolation frame,
o. three links extending from the isolation frame forward toward the vehicle.

4,227,579
DIKE PRODUCING DEVICE

William C. Isbell, Petersburg, Tex., assignor to Ken Isom; Larry Isom and Rex Isom, all of Idalou, Tex., part interest to each

Filed Aug. 22, 1978, Ser. No. 938,304
Int. Cl.[3] A01B *13/16*
U.S. Cl. 172—64 4 Claims



1. In combination, a dike forming device and a lister point comprising: a longitudinally extending frame; a plate member connected at one end of said frame; a hitch means connected to the opposite end of said frame for attaching said frame to said lister point, said hitch means including a pair of vertically oriented plates disposed adjacent opposite sides of said lister point and further including a horizontal pivot axis and a vertical pivot axis; wheel means connected to said frame for supporting said frame, said wheel means including a plurality of radially extending spokes with at least one of said spokes being longer than one other of said spokes; a cylindrical band connected on one side to each of said spokes for supporting said wheel means in soft soil, each of said spokes having a free end extending radially outward of said band; a reinforcing member connected between the outer surface of said cylindrical band and the free end of said at least one longer spoke; and bearing means supporting and journalling said wheel means on said frame.

4,227,580
IMPLEMENT WITH SIDE SCREENING PLATES AND SOIL ROLLER

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburgh, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

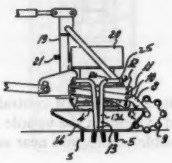
Continuation of Ser. No. 567,695, Apr. 14, 1975, Pat. No. 4,178,997, which is a continuation of Ser. No. 393,026, Aug. 30, 1973, abandoned, which is a division of Ser. No. 172,511, Aug. 17, 1971, Pat. No. 3,774,689. This application Jan. 2, 1979, Ser. No. 595

Claims priority, application Netherlands, Aug. 18, 1970, 7012157

The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.

Int. Cl.³ A01B *33/12*

U.S. Cl. 172—112 **5 Claims**



1. A harrow comprising an elongated frame extending transverse to the normal direction of travel and a plurality of adjacent soil-working members supported in a row on said frame, drive means being provided for rotating said soil-working members about upwardly extending axis and each of said members comprising a substantially horizontal support with at least one downwardly extending tine, a substantially vertical screening plate being normally positioned adjacent each opposite lateral side of said row, said plate extending in the general direction of travel and having a lower edge, said lower edge being positioned to ride over the ground during travel, said plate being pivoted to said frame through arm means and said arm means extending from said plate upwardly and then substantially horizontally, in the longitudinal direction of said frame, said arm means being pivoted to the frame a substantial distance from the lateral side thereof and said distance corresponding substantially to the distance between the axes of rotation of two adjacent soil-working members, said plate being freely turnable upwardly and downwardly to match ground undulations during travel, a soil compressing roller being connected to the frame by pivotable supports, said roller being positioned to the rear and spaced from said row and said plate being positioned between the roller and said soil working members, when viewed from the side, to screen the space between the roller and said members.

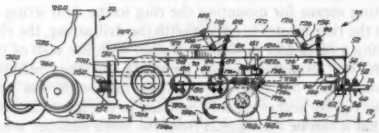
4,227,581
GROUND PREPARING APPARATUS FOR NO-TILL PLANTING

Harry A. Klotzbach, 7380 Macomber Rd., Oakfield, N.Y. 14125

Filed May 15, 1978, Ser. No. 905,582

Int. Cl.³ A01B *49/06*

U.S. Cl. 172—142 **10 Claims**



1. Apparatus for preparing ground for seed planting adapted to be drawn over along a field by an agricultural vehicle along with and forwardly of a planting machine, said apparatus comprising:

(a) a first frame adapted to be connected at one end to said vehicle and at an opposite end to said planting machine;

(b) a second frame having a leading end near said vehicle and a trailing end near said planting machine;

(c) holding means connected to said first and second frames for supporting said second frame by said first frame in a manner permitting limited movement of said second frame in a direction toward and away from the ground;

(d) a colter disc rotatably carried by said secoqd frame, said disc penetrating the ground in a manner forming a slit in the ground in a direction substantially parallel to the direction of travel of said apparatus along the field, said colter disc serving to cut plant stalks and the like debris during formation of the slit;

(e) first and second tooth elements carried by said second frame between said colter disc and said trailing end of said second frame, said first tooth element being located near said colter disc and laterally offset a relatively small distance to one side of the slit formed by said disc, said secnd tooth element being longitudinally spaced from said first tooth element and laterally offset a relatively small distance to the opposite side of the slit formed by said disc, the longitudinal spacing between first and second tooth elements being sufficient to allow any debris encountered by said first tooth element to move between said tooth elements in a manner preventing clogging of said tooth elements, said tooth elements penetrating the ground on opposite sides of the slit and cutting the ground in a manner forming a band-like region of prepared ground disposed substantially parallel to the direction of travel of said apparatus for receiving particulate matter including seed dispensed by said planting machine;

(f) at least one ground contacting wheel element rotatably connected to said second frame, said wheel element laterally spaced from the band formed by said colter disc and said teeth, said wheel element controlling the depth of penetration of said colter disc and said tooth elements into the ground; and

(g) means for connecting said leading end of said second frame to said first frame in a manner providing a degree of movement of said leading end of said second frame in a direction substantially perpendicular to the ground, said connecting means comprising means defining a slot in said first frame and a pin carried by said leading end of said second frame and movable along said slot in said first frame.

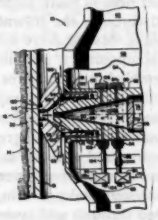
4,227,582
WELL PERFORATING APPARATUS AND METHOD

Ernest H. Price, 1266 Pepper Dr., El Centro, Calif. 92243

Filed Oct. 12, 1979, Ser. No. 84,355

Int. Cl.³ E21B *7/15, 29/02, 43/11*

U.S. Cl. 175—16 **11 Claims**



8. A method for completing a well comprising the steps: drilling a well bore through a formation;

positioning a well casing in the well bore adjacent said formation;

positioning a laser beam source in said casing adjacent said formation;

energizing said laser beam source and emitting a laser beam onto said casing during a penetrating cycle;

discharging a jet of pressurized gas which is exothermically reactive with the well casing material along the path of the laser beam and toward the well casing during the penetrating cycle;

interrupting the laser beam while discharging the exothermic gas into the region of penetration during an ejection cycle following the penetrating cycle.

4,227,583

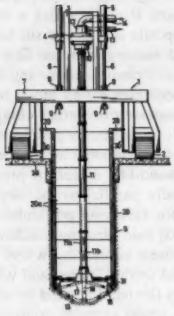
METHOD AND APPARATUS FOR SINKING SHAFTS

Joseph R. Benjamin, London, England, assignor to Wirth Maschinen-und Bohrgeräte-Fabrik, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,738

Int. Cl.[2] E21B *3/02, 17/00*; E21D *1/06, 1/08*

U.S. Cl. 175—65 **13 Claims**



10. An apparatus for sinking shafts comprising a drill bit and a bearing associated with said drill bit for supporting of at least one walling section forming a shoring for the shaft and which is inserted into the shaft simultaneously with the drilling thereof including a drill-rod system, a power swivel connectable to the upper end portion of said drill-rod system, and means for vertically moving the power swivel.

4,227,584

DOWNHOLE FLEXIBLE DRIVE SYSTEM

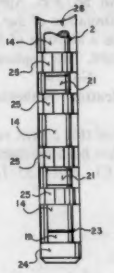
W. B. Driver, 19 Sheridan Rd., Arnold, Md. 21012

Continuation-in-part of Ser. No. 827,689, Aug. 25, 1977, Pat. No. 4,143,722. This application Dec. 19, 1978, Ser. No. 970,919

Int. Cl.[2] E21B *7/04, 1/06*

U.S. Cl. 175—95 **3 Claims**

1. A downhole flexible drive system which attaches to the downhole end of a drill pipe string and operates a drill bit for the drilling of a curved hole in earth formations and drilling fluids can be pumped through the downhole flexible drive system and the downhole flexible drive system comprises: an assembly of motors comprising a plurality of double shaft downhole motors assembled in line a three hundred and sixty degree flexible connection connects the respective ends of said double shafts of said motors forming a flexible joint between said motors, a three hundred and sixty degree flexible assembly constructed to said motors and encloses said flexible connection forming a flex point in said drive system and supports the structure of said drive system and providing a means for drilling fluids to be pumped through said system, an uphole tool joint attached to the uphole end of said system so said drive system can be attached to said drill pipe string and receive drilling fluids from said drill pipe string, a downhole tool joint, a connecting mechanism for connecting said downhole tool joint to the downhole end of said drive system so said drive system can be attached to said drill bit and said motors can



operate said drill bit, a plurality of centralizers, a centralizer attached around said system on the uphole side and downhole side of each said flexible connection near said flexible connection.

4,227,585

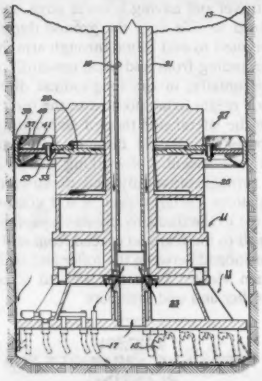
ROTATING STABILIZER FOR SHAFT DRILLING

Joseph M. Glass, Jr., Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 28, 1978, Ser. No. 974,206

Int. Cl.[2] E21B *7/10*

U.S. Cl. 175—325 **5 Claims**



1. In an apparatus for drilling large diameter shafts of the type having a drill bit secured to the end of a string of drill pipe, the drill bit having a plurality of rotatable cutters, and a plurality of weights carried on top of the drill bit, an improved means for centering the drill string in the shaft, comprising:

a metal ring of diameter substantially that of the shaft;

mounting means for mounting the ring to the drill string so that the ring rotates in unison with the drill string, the ring having a perimeter in sliding contact with the wall of the shaft, the mounting means including an inner member carried with the shaft for rotating therewith, the ring being rigidly and releasably coupled to the inner member so that it can be disengaged from the inner member when pulling the bit to the surface; and

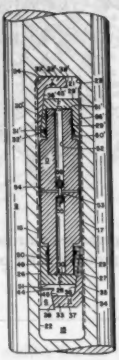
passage means in the mounting means for allowing fluid in the shaft to flow past the ring.

4,227,586

ROLLER REAMER APPARATUS

Grey Bassinger, One Allen Center, Suite, 100, Houston, Tex. 77002, assignor to Grey Bassinger, Midland, Tex.

Filed May 8, 1978, Ser. No. 903,841
Int. Cl.[2] E21B 9/24, 9/08
U.S. Cl. 175—346 17 Claims



1. A roller reamer assembly for mounting in a longitudinally extending undercut groove comprising:

a roller cutter having a bearing journal on each end thereof mounted in said undercut groove;

a bearing block mounted for longitudinal sliding movement within the undercut groove at each end of said roller cutter, each of said bearing blocks having a bearing journal therein for matingly receiving a respective one of said roller cutter bearing journals;

each of said blocks having one side wall matingly and slidably engaging a side wall of said undercut groove, the opposite side wall on each of said blocks longitudinally tapering away from said roller cutter;

a first locking member on one end of said assembly, said first locking member being located in said undercut groove and having a side wall matingly engaging the tapered side wall on a bearing block in sliding relationship thereto;

a second locking member on the other end of said assembly, said second locking member being slidably mounted in said undercut groove and having one side wall slidably and matingly engaging a side wall of said undercut groove, the opposite side wall slidably and matingly engaging the tapered side wall on the other bearing block;

such that relative longitudinal sliding movement between a locking member and a bearing block creates a transverse force moving the wall surfaces into tighter contact with each other to securely lock the bearing block within the under cut groove and such that longitudinal forces acting in the same direction on each bearing block and its locking member will not tend to loosen them but rather retain them in tight locking engagement; and

a third locking member located in said undercut groove to operatively engage said second locking member and to move the wall surfaces into tighter contact with each other.

4,227,587

AUTOMOTIVE DRIVE SYSTEM

Vincent E. Carman, Portland, Oreg., assignor to Vehicle Energy Corporation, Menlo Park, Calif.

Continuation of Ser. No. 765,951, Feb. 7, 1977, abandoned. This application Oct. 5, 1978, Ser. No. 948,827
Int. Cl.[2] B60K 9/00
U.S. Cl. 180—165 15 Claims

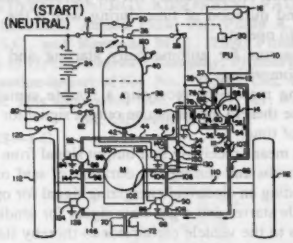
1. In a wheeled vehicle having an engine for driving the vehicle, a starting system for selectively storing energy normally lost in braking the vehicle and releasing the stored energy to start the engine, said starting system comprising:

(a) an accumulator for storing pressurized fluid;

(b) a reservoir for storing fluid;

(c) hydraulic pump means mechanically coupled to the wheels of said vehicle for being driven by said wheels, said pump means having an inlet and an outlet;

(d) first control means for selectively hydraulically connecting the inlet of said pump means to said reservoir and the outlet of said pump means to said accumulator for pumping hydraulic fluid from said reservoir into said accumulator for storage therein under pressure in response to the driving of said pump means by said wheels to brake said vehicle;



(e) hydraulic motor means mechanically coupled to said engine for driving and thereby starting said engine, said motor means having an inlet and an outlet;

(f) second control means for selectively hydraulically connecting the inlet of said motor means to said accumulator for receiving said hydraulic fluid from said accumulator and the outlet of said motor means to said reservoir to drive said engine for starting; and

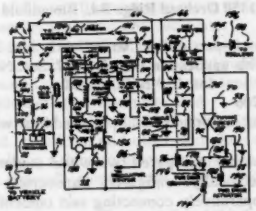
(g) speed responsive means connected to said engine for determining the speed of rotation thereof, said second control means including valve means responsive to said speed responsive means for stopping the flow of hydraulic fluid from said accumulator to said motor means when the engine has reached a predetermined speed.

4,227,588

AUTOMATIC VEHICLE STARTING APPARATUS

Michael J. Biancardi, 88 Weeks Rd., N. Babylon, N.Y. 11703

Filed Dec. 6, 1978, Ser. No. 966,800
Int. Cl.[3] F02N 11/08
U.S. Cl. 180—167 21 Claims



1. Apparatus for automatically starting and operating a vehicle comprising: receiving means for receiving a remote signal and in response thereto producing an output signal for a first duration of time; starting means receiving said output signal from said receiving means and during the duration of said output signal providing an electrical energizing signal for operating the vehicle starter and a gas flow signal for sending a supply of gas to the vehicle carburetor to thereby start the vehicle, and operating means responsive to said starting means

for providing an electrical operating signal to the vehicle ignition system for a second duration of time for running the vehicle, wherein said operating means comprises a timing circuit triggered by said starting means and operative thereafter for a preset time period forming said second duration of time, an operating relay coil coupled to the output of said timing circuit for energization thereby from the vehicle battery during said second duration of time, at least three contact switches operated by said operating relay coil, one contact of one contact switch being adapted for connection to the vehicle battery, the other contact of said one contact switch being coupled to one contact of a second contact switch, and the other contact of the second contact switch being adapted for connection to the vehicle ignition coil, whereby upon triggering of said timing circuit, the vehicle ignition coil is interconnected to the vehicle battery for energization thereby during said second duration of time during which the vehicle will continue to operate.

6. Apparatus for automatically starting and operating a vehicle, comprising:

receiving means for receiving a remote signal and in response thereto producing an output signal for a first duration of time;

starting means receiving said output signal from said receiving means and during the duration of said output signal providing an electrical energizing signal for operating the vehicle starter and a gas flow signal for sending a supply of gas to the vehicle carburetor to thereby start the vehicle;

operating means responsive to said starting means for providing an electrical operating signal to the vehicle ignition system for a second duration of time for running the vehicle, and

equipment activating means responsive to the electrical operating signal from the operating means for activating at least some of the vehicle accessory electrical equipment, wherein said electrical activating means comprises an activating relay coil adapted for coupling to the vehicle regulator stator and being energized by said operating means, a plurality of contact switches operated by said activating relay coil, one contact of each of said contact switches being adapted for connection to the vehicle battery, the other contact of each of said contact switches being adapted for connection to a respective one of the vehicle accessory electrical equipment, including the heater, air conditioner, defroster, and the like.

4,227,589

COMBINED ENGINE AND PEDAL POWERED VEHICLES

John J. Chika, 1350 Orchard Ridge Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 437,482, Jan. 28, 1974, abandoned. This application Dec. 5, 1977, Ser. No. 857,567

Int. Cl.³ B62D *61/00*

U.S. Cl. 180—206 **57 Claims**

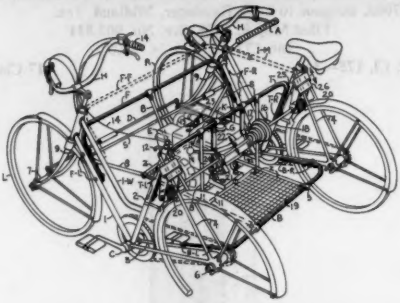
1. A combined motor and pedal-powered four-wheel vehicle comprising:

a. two compatibly configured two-wheel tandem vehicles;

b. plural, specifically configured, transversely rigid cross members operatively connecting said tandem vehicles in side-by-side parallel relation; each cross member bent to form a longer mid-portion and two shorter end-portions; said longer mid-portions positioned substantially horizontally and transversely between said tandem vehicles; said shorter end-portions aligned with and secured to corresponding frame members of said tandem type vehicles at plural spaced-apart points;

c. a modified trapezium steering linkage operatively interconnecting conventional steerable front wheels of said tandem vehicles;

d. auxiliary motor means of propulsion optionally propelling at least one wheel of said four-wheel vehicle; and



e. means combining operative controls of said vehicle and its means of auxiliary propulsion for one-person operation.

4,227,590

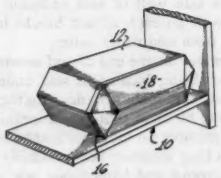
GRILLE FOR LOUDSPEAKER CABINET

John R. Ballantyne, Pacific Palisades, Calif., and Axel M. Heden, deceased, late of Granada Hills, Calif. (by Ingrid V. Heden, executrix), assignors to Superscope, Inc., Chatsworth, Calif.

Filed Mar. 7, 1978, Ser. No. 884,372

Int. Cl.³ G10K *11/00*

U.S. Cl. 181—175 **18 Claims**



1. The combination of a cabinet containing at least one loudspeaker and a non-planer grille mounted on said cabinet for permitting sound to emanate from said cabinet through said grille, said grille comprising:

a substantially planar polygonal frame including means for securing said frame to a substantially planar face of said cabinet, said frame having a size and shape corresponding to the size and shape of said face of said cabinet, said frame comprising an equal number of elongated frame members and corner brackets, each corner bracket joining two frame members at a predetermined angle, said frame members being substantially tubular and being joined to said corner brackets by fitting over projections on said corner brackets;

a ridge structure disposed upon said frame and comprised of a plurality of elongated ridge members which intersect at at least one point outside of the plane of said frame, said ridge structure comprising a number of corner ridge members equal to the number of frame members, each corner ridge member having one end secured to a corner bracket and the other end secured to a ridge joint member at a point outside of the plane of said frame; and

a covering material disposed over said structure and secured to said frame.

4,227,591

MUFFLER FOR AIR-POWERED NAILERS AND THE LIKE

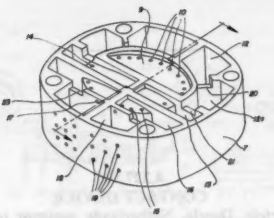
Arthur Klaus, Frankfurt am Main, and Horst Tacke, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Signode Corporation, Glenview, Ill.

Filed May 29, 1979, Ser. No. 42,767

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827279

Int. Cl.[3] F01N *1/08*

U.S. Cl. 181—230 7 Claims



1. In an air outlet muffler for the compressed air exhausted from the outlet side of a main control valve of a portable air-powered driving tool comprising air outlet duct means formed by a housing endpiece and a top lid of the driving tool, and in which the outlet side of the main control valve is joined with the outside air by the air outlet duct, the improvement consisting of the muffler having chambers joined with each other through wall hollows and wherein at least two of the chambers are joined directly through holes leading from the outlet side of the main control valve.

4,227,592

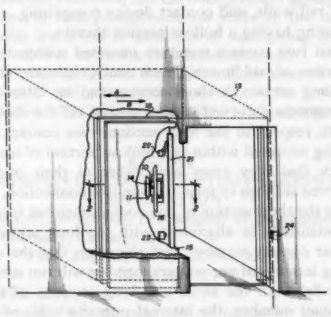
DUPLEX DOOR SAFETY RECYCLING SYSTEM

Floyd L. Foreman, 15906 Tall Shadows, Houston, Tex. 77032, and Emmet D. Fenton, 3806 Crater Lake Ct., Irving, Tex. 75062

Filed Dec. 22, 1978, Ser. No. 972,515

Int. Cl.[3] B66B *13/00*

U.S. Cl. 187—56 7 Claims



5. A method for recycling clutch-connected duplex doors from a doors closing cycle to a doors opening cylce comprising:

(a) affixing to a first clutch member mounted on a clutch-driven first door of a duplex doors system an electric current switch means in a position for transmission of all forces between said first clutch member and a second clutch member mounted on a clutch-driving second door of said duplex doors system during a doors closing cycle of said duplex doors system through a body of said electric current switch means:

(b) providing in said body for actuating said electric current switch means as a result of a closing force being transmitted through said body being increased by a force applied externally on said first door resisting the closing force;

(c) activating thereby as a result of so actuating the switch means an electrical control circuit electrically connected to said switch means and to an electric motor driving the clutch-driving second door in the doors closing cycle; and

(d) reversing thereby a rotational direction of said causing the motor to drive the clutch-driving second door in a doors opening cycle.

4,227,593

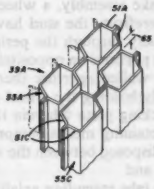
KINETIC ENERGY ABSORBING PAD

Robert J. Bricmont, Allison Park, Pa.; Philip A. Hamilton, Seneca, S.C., and Raymond M. L. Ting, Pittsburgh, Pa., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 728,949, Oct. 4, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 855,074

Int. Cl.[2] F16F *7/12*

U.S. Cl. 188—1 C 15 Claims



1. An energy absorbing pad providing stepwise absorption of the kinetic energy of an impact load, comprising:

a face plate adapted to be positioned transversely of and in confronting relation with said impact load;

a base plate spaced-apart from and substantially parallel with said face plate; and

a crushable core positioned between said face plate and said base plate and adapted to buckle under the force of said impact load, said core including a first set and a second set of profiled sheet metal elements having corrugations normal to said face plate, said profiled sheet metal elements being assembled in pairs, each of said pairs constituting a metal cellular unit which buckles independently of each other said unit under the force of said impact load,

the elements of said first set and of said second set presenting first end faces adjacent to one said plate and residing substantially in a first common plane which extends generally parallel with said one said plate,

the elements of said first set presenting second end faces adjacent to the other said plate and residing substantially in a second common plane which extends generally parallel with said other said plate, and

the elements of said second set presenting third end faces spaced-apart from said other said plate and residing substantially in a third common plane which extends between and is generally parallel with the first and second common planes,

the distance between the second and third end faces ranging from a minimum of 0.25 inch to a maximum of 0.75 inch;

said face plate being adapted to distribute the force of said impact load initially to said first set of said profiled elements through the first and second end faces thereof, and subsequently and simultaneously to said second set of said profiled elements through the first and third end faces thereof and to said first set of profiled elements, thereby to initiate axial buckling of said second set of profiled elements after initiation of the axial buckling of said first set of profiled elements thereby to significantly lower the

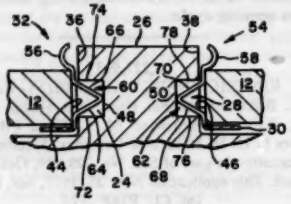
dynamic peak loads sustained by said pad and said base plate without significantly reducing the energy absorbing capacity of said pad.

4,227,594

BACKING PLATE-WHEEL CYLINDER RETAINING CLIP

Michael A. Kluger, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 25, 1979, Ser. No. 33,086
Int. Cl.³ F16D *65/24*
U.S. Cl. 188—361 **7 Claims**



1. In a drum brake assembly, a wheel cylinder including a stud projecting therefrom, the stud having a pair of recesses extending tangentially through the peripheral surface thereof and including edge portions on oppositely facing walls, a backing plate having a walled aperture therewithin and retaining means for releasably holding the wheel cylinder in a mounted position on the backing plate wherein the stud is received by the aperture, the retaining means comprising:

an annular base disposed between the wheel cylinder and the backing plate; and

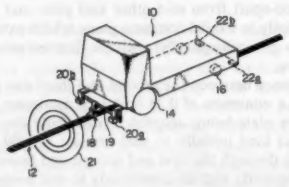
a pair of flexible tabs extending axially away from the base and projecting into the aperture when the retaining means is installed on the backing plate, each tab having one end secured to the base, the opposite end of each tab defining a portion grasping the backing plate, the portion of each tab interconnecting the ends of the tab including a flexible projection comprising a pair of intersecting legs, each recess receiving a corresponding one of the projections and the edge portions of the recess engaging the legs of the corresponding projection to hold the wheel cylinder in the mounted position wherein the recesses are disposed within the backing plate aperture and are facing toward the wall of the backing plate aperture.

4,227,595

CURRENT TRANSMITTING SYSTEM FOR ELECTRICAL VEHICLE

Mitsuharu Hamada, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Jun. 14, 1979, Ser. No. 48,377
Claims priority, application Japan, Sep. 7, 1978, 53-109102
Int. Cl.³ B60L *1/00, 9/00*
U.S. Cl. 191—2 **1 Claim**



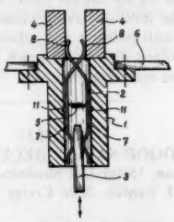
1. In a current transmitting system, for use with a self-propelled automatically steered electric vehicle, including a pair of parallel, circularly arranged bus bars connected to a low-frequency A.C. power source; an induction cable extending along said bus bars and connected to a high-frequency A.C. power source; and current collecting means slidable on and along each of said bus bars for transmitting the current carried by said bus bar to an electric device mounted in said vehicle, the improvement in that each of said bus bars is divided into two sections which are isolated from each other, one of said sections being connected to said low-frequency A.C. power source through a coil.

4,227,596

CONTACT DEVICE

Willem Bartels, Daarle, Netherlands, assignor to Hazemeijer B.V., Netherlands

Filed Jun. 7, 1978, Ser. No. 913,470
Claims priority, application Netherlands, Jun. 8, 1977, 7706308
Int. Cl.³ B60M *1/34*
U.S. Cl. 191—23 A **7 Claims**



1. A contact device for electrically contacting a removable contact finger with two electrically energized spaced-apart, parallel rail walls, said contact device comprising

a housing having a hollow portion therein,

at least two contact members mounted within the hollow portion of said housing, each contact member comprising a long section, a short section and an interconnecting intermediate curved section setting off the short section with respect to the long section, two contact members being mounted within said hollow portion of said housing such that they cross each other at their intermediate curved sections to form a hinge-like connection, and such that the short section of one contact member is positioned substantially in alignment with the long section of the other contact member, and also such that the short and long sections of one contact member will run substantially parallel with the short and long sections of the other contact member, the internal opposite sides of the long sections of the contact members forming the means for contacting the removable contact finger while the external sides of the short sections of the contact members, which extend outwardly of said housing, form the means for contacting the inner sides of the respective rail walls, and

a biasing means connected between the long sections of two contact members for providing a contact pressure between the contact areas of said contact members and both the contact finger and the rail walls.

4,227,597

HYDRAULIC CONTROL SYSTEM FOR A HYDRODYNAMIC/MECHANICAL TRANSMISSION

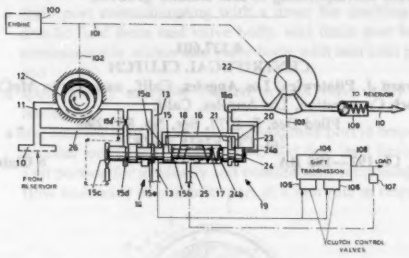
Georg Gierer, Kressbronn, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 21, 1977, Ser. No. 863,067

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658195

Int. Cl.² F16D *39/00*

U.S. Cl. 192—3.33 7 Claims



1. A hydraulic control system for a hydrodynamic/ mechanical transmission having fluid-operated clutches, comprising:

a pump having an intake and an outlet;

a main pressure line connected to said outlet and to said clutches;

a main pressure valve connected to said main pressure line and having a valve member displaceable with increasing pressure in said main pressure line to bypass hydraulic fluid to said intake;

a pressure-control valve having only two controlled ports, one of said ports being connected to said main pressure line and the other of said ports being connected to a hydrodynamic unit of said transmission, said hydrodynamic unit having a fluid inlet, said pressure-control valve having a valve member biased by a spring into an open position and means for applying the inlet pressure of said unit to said member of said pressure-control valve in a direction opposite the effective direction of said spring, said pressure-control valve being constructed so that said spring biases said member of said pressure-control valve into an open condition and the inlet pressure applied to the member of said pressure-control valve in the direction opposite the effective direction of said spring urges the latter member toward a closed position; and

means for applying load-dependent fluid pressure to said member of said pressure-control valve in the direction in which the latter member is biased by said spring.

4,227,598

TRANSMISSION DISCONNECT WITH PARKING BRAKE APPLICATION

Robert G. Luft, Wildwood, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 11, 1978, Ser. No. 933,259

Int. Cl.² F16H *57/10*

U.S. Cl. 192—4 A 1 Claim

1. A completely pneumatic control means for coordinated actuation of air-actuated service brake and parking brake systems with a transmission disconnect on a vehicle having a transmission and a spring-apply, pressure-release parking brake; comprising:

a source of air pressure;

a parking brake cylinder normally biased to apply said parking brake and connected to release said parking brake upon receiving air pressure;

a parking brake valve interposed between said source and said parking brake cylinder and moveable between a release position in which pressure from said source is directed to said parking brake cylinder and an apply position in which said parking brake cylinder is exhausted to atmosphere;

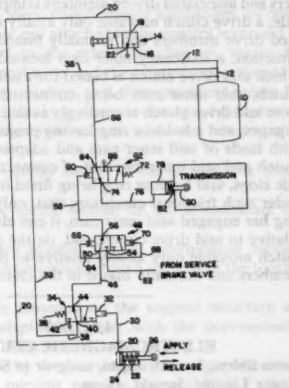
a pneumatic transmission disconnect cylinder having a rod connected to the transmission and first bias means urging said rod toward a position in which said transmission is operative and upon receiving air pressure moves said rod to neutralize said transmission;

a transmission disconnect valve moveable between a disconnect position in which air pressure is directed from said source to said disconnect cylinder and a connect position in which said disconnect cylinder is exhausted to atmosphere;

second bias means normally urging said disconnect valve to its connect position;

first penumatic actuator means on said transmission disconnect valve for movement of said disconnect valve to its disconnect position in response to said first actuator means receiving air pressure;

a shuttle valve having second and third pneumatic actuator means;



a first conduit connecting said shuttle valve to said first actuator means;

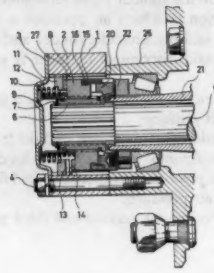
a parking brake signal valve having a fourth actuator means and a third bias means, said third bias means normally biasing said signal valve to a first position in which air pressure from said source is directed to said shuttle valve and said second actuator means to shift said shuttle valve to direct air pressure through said first conduit to said first actuator means, and when said parking brake valve is moved to its release position said fourth actuator means receiving air pressure from said source to shift said signal valve to exhaust said second actuator means to atmosphere; and

second conduit means connecting said service brake system to said shuttle valve and said third actuator, air pressure in said second conduit means shifting said shuttle valve means to direct air pressure through said first conduit to said first actuator means to cause said disconnect valve to direct air pressure from said source to said disconnect cylinder.

4,227,599
AUTOMATIC CLUTCH

Hideyuki Ishiwata, Kawasaki, and Kunihiro Ishino, Yokohama, both of Japan, assignors to Automobile Parts Manufacturing Company Limited, Japan

Filed Jun. 16, 1978, Ser. No. 916,144
Int. Cl.[2] F16D *11/00, 43/02*
U.S. Cl. 192—54 3 Claims

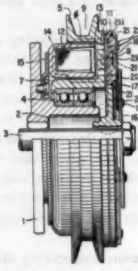


1. An automatic clutch for engaging associated drive members and associated driven members comprising, on the driving side, a drive clutch movable only axially relative to the associated drive members and normally biased in the de-clutching direction, a stationary inner cam located on the side toward which said drive clutch is biased for axially caming said drive clutch, said inner cam being connected to or disconnected from said drive clutch accordingly as said clutch disengages or engages, and a holdout ring having projections to be engaged with lands of said inner cam and adapted to keep said drive clutch and said inner cam out of connection unitl the driving side stops, said holdout ring being fitted over said drive clutch under such frictional conditions that, only when said holdout ring has engaged said inner cam, it can circumferentially slide relative to said drive clutch, and, on the driven side, a driven clutch movable only axially relative to the associated driven members and normally biased in the clutching direction.

4,227,600
ELECTROMAGNETIC CLUTCHES

Isamu Shirai, Isesaki, Japan, assignor to Sankyo Electric Company Limited, Isesaki, Japan

Filed Oct. 18, 1978, Ser. No. 952,545
Claims priority, application Japan, Oct. 18, 1977, 52-139592; Oct. 18, 1977, 52-139593; Oct. 18, 1977, 52-139594
Int. Cl.[3] F16D *27/10*
U.S. Cl. 192—84 C 6 Claims



1. In an electromagnetic clutch comprising a first rotatable member having an axial end plate of magnetic material, said end plate being provided with a plurality of concentric slits disposed on at least one circle, thereby to define a plurality of annular or arcuate magnetic pole pieces, a second rotatable member, a cooperating annular armature plate of magnetic material joined to said second rotatable member so as to be capable of limited axial movement, said annular armature plate facing said axial end plate of said first rotatable member with an axial gap therebetween, and electromagnetic means associated with said axial end plate for attracting said armature plate, said armature plate being provided with at least one annular groove in an axial end surface thereof facing said axial end plate and corresponding to said concentric slits and with at least one annular projection on an opposite axial end surface thereof corresponding to said annular grooves.

4,227,601
CENTRIFUGAL CLUTCH

Edward J. Pilatowicz, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Dec. 5, 1977, Ser. No. 857,290
Int. Cl.[3] F16D *43/18*
U.S. Cl. 192—105 BA 6 Claims

1. A centrifugal clutch comprising
a driving member,
a driven member, said driven member including a clutch drum,
a plurality of centrifugally responsive clutch shoe members operatively supported by said driving member for movement of a friction surface of each said clutch member into and out of engagement with said clutch drum,
a resilient restraining means for applying a radially inwardly directed bias to the clutch shoe members, said resilient means comprising
a coiled spring member extending around a circumference of said clutch inwardly from said clutch drum and in contact with each clutch shoe member, and
a rod spring member extending substantially a complete extent of and enclosed within said coiled spring member,
said rod spring having at least a circumferential portion thereof spaced apart from an inner portion of said coiled spring,
said coiled spring and said rod spring each contribute to said radially inwardly directed bias, and
whereby the idle range for said clutch is increased over the use of the coiled spring or the rod spring by itself.

4,227,602
HYDRAULIC POWER CLUTCH CONTROL SYSTEM HAVING AN INCHING VALVE

Yasufumi Ideta, and Shoei Watanabe, both of Koganei, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 23, 1977, Ser. No. 864,147
Claims priority, application Japan, Dec. 27, 1976, 51/156543
Int. Cl.[2] F16D *11/00*
U.S. Cl. 192—109 F 8 Claims

1. A hydraulic control system in combination with at least one hydraulic power clutch, comprising:
a source feeding a hydraulic fluid pressure,

a pressure regulating valve for regulating said hydraulic fluid pressure to a control pressure, the clutch being communicable with said pressure regulating valve for receiving said control pressure for engagement of the clutch, and

an inching valve disposed between said pressure regulating valve and the clutch and comprising:

a valve body which having

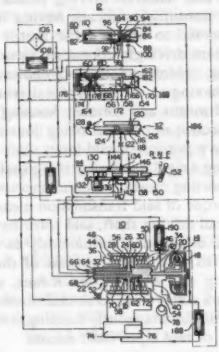
an inlet port communicating with said pressure regulating valve for admitting hydraulic fluid into said valve body,

an outlet port communicating with the clutch for the outflow of hydraulic fluid from said valve body, and

a drain port communicating with a drain for draining hydraulic fluid from said valve body, said drain port being communicable within said valve body with said inlet port, and

a spool axially movably located in said valve body and having

a first land for opening and closing said inlet port in response to axial movement of said spool, said first land having a first portion for gradually and continuously increasing the flow resistance of said inlet port at a first rate in response



to axial movement of said spool in a first direction until said first land fully closes said inlet port and for gradually and continuously reducing the flow resistance of said inlet port at said first rate in response to axial movement of said spool in a second direction opposite to said first direction until said first land fully opens said inlet port, and

a second land for opening and closing said drain port for providing and obstructing communication between said inlet and drain ports in response to axial movement of said spool,

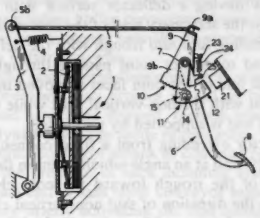
said second land having a second portion for abruptly reducing the flow resistance of said drain port at a second rate higher than said first rate immediately after said second land first opens said drain port in response to axial movement of said spool in said first direction, and for abruptly increasing the flow resistance of said drain port at said second rate immediately before said second land fully closes said drain port in response to axial movement of said spool in said second direction, and for subsequently gradually reducing the flow resistance of said drain port at a third rate lower than said second rate in response to axial movement of said spool.

4,227,603

DEVICE FOR AUTOMATIC COMPENSATION OF WEAR IN FRICTION DRIVE CLUTCHES OF MOTOR VEHICLES

Osvaldo Fasano, Villarbasse, Italy, assignor to Start S.p.A. Studi Apparecchiature E Ricerche Tecniche, Turin, Italy

Filed Nov. 15, 1978, Ser. No. 961,072
Int. Cl.[2] F16D *13/75*
U.S. Cl. 192—111 A **7 Claims**



1. Device for automatically compensating for wear in a friction clutch of a motor vehicle, comprising a driver-operable control lever for effecting clutch disengagement, said control lever having a rest position, an intermediate element articulated to the control lever, clutch release mechanism, an operating cable having one end attached to the control lever and its other end connected to the release mechanism, means for interlocking the control lever and the intermediate element to prevent their relative rotation, and disengagement means for counteracting the interlocking means to disengage the intermediate element from the control lever when the latter is in its rest position,

wherein the improvements consist in the interlocking means comprising:

a toothed circular sector formed on the intermediate element,

a support structure pivoted on the intermediate element about an axis which coincides with the axis of the toothed sector,

a pinion rotatably mounted on the support structure and having teeth adapted to mesh with the corresponding teeth of the toothed sector,

stop means carried by the control lever for engagement with the pinion to prevent rotation thereof during clutch-operating movement of said lever,

resilient engagement means urging the stop means into engagement with the pinion,

resilient biasing means acting upon the control lever in opposition to said resilient engagement means to return the control lever to its said rest position, and

means cooperating with said biasing means for limiting the return movement of the pinion support structure, to effect disengagement of said pinion from the stop means upon return of the control lever to said rest position.

4,227,604

COIN SELECTING FUNNEL

Jack S. Chalabian, Gardena, Calif., assignor to K-Jack Engineering Company, Inc., Gardena, Calif.

Filed Mar. 26, 1979, Ser. No. 23,835
Int. Cl.[3] G07F *3/04*
U.S. Cl. 194—102 **2 Claims**

1. A coin selecting funnel for use in a coin operated vending machine for receiving coins inserted into the machine through a slot, for routing coins larger than a certain diameter into a descending coin chute and for routing coins smaller than that certain diameter into a coin return passage, the descending coin chute including a stationary wall and a pivotable wall adapted to be pivoted away from the stationary wall to selec-

tively open the descending coin chute, said coin selecting funnel comprising:

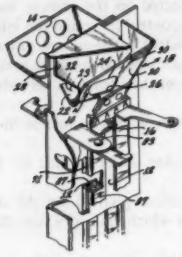
a trough including a non-vertical wall and a ledge which intersect along a vertex, the trough and vertex descending from an upper end of the trough positioned at a point below the slot to a lower end of the trough positioned at the top of the descending coin chute, said trough being affixed to the pivotable wall of the descending coin chute to pivot with it;

a deflector having a deflector surface with the deflector affixed to the stationary wall of the descending coin chute and extending into said trough with the deflector surface positioned to deflect coins passing through said trough such that one of the coin faces is moved into sliding engagement with the non-vertical wall while the coin edge contacts and is supported by said ledge;

said deflector extending from a fixed connection with the stationary wall at an angle which opens in the direction of descent of the trough toward the coin chute and also opens in the direction of said non-vertical chute wall;

said deflector having a forward end which is spaced from the non-vertical chute wall such that coins within the chute may pass through the space after being deflected into sliding contact with said non-vertical wall;

said pivotable wall being pivoted about a pivot axis which is positioned adjacent the upper end of the trough such that



pivoting of the wall pivots the lower end of the trough away from the stationary wall;

said deflector having a lower edge that is spaced from said trough;

the spacing between said lower edge and the trough being greatest near the upper end of the trough and least near the lower end of the trough;

said non-vertical wall including an aperture having an upper edge extending parallel to the vertex of said trough and spaced from the vertex by a distance exceeding that certain diameter, said aperture including a lower edge extending parallel to the vertex of said trough and spaced from the vertex by a distance less than half that certain diameter, said aperture extending along said trough beyond said deflector so that coins smaller than that certain diameter will topple over the lower edge of said aperture through said non-vertical wall into the coin return passage and coins larger than that certain diameter will be supported by the upper and the lower edges of said aperture so as to be conducted along said trough to said descending coin chute, and

the spacing between said lower edge and said trough providing free pivotal movement of said pivotable wall about said pivot axis without interference of the deflector with said trough as the coin chute and coin selecting funnel are opened.

4,227,605

DRIVING UNIT FOR ESCALATORS FOR DRIVING THE STEP BAND

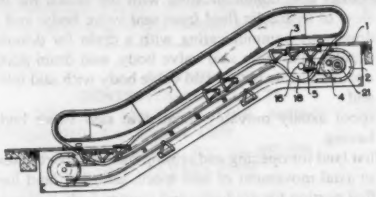
Peter Höfling, Dortmund, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel Aktiengesellschaft, Berlin, Fed. Rep. of Germany

Filed Sep. 16, 1976, Ser. No. 724,106

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1975, 2541397

Int. Cl.[2] B66B 9/14

U.S. Cl. 198—331 **6 Claims**



1. In combination with an endless step band for an escalator having handrails: a driving unit arranged inwardly of said endless step band and comprising an electric motor and transmission means and handrail driving means for driving said handrails, said transmission means having input shaft means drivingly connected to said electric motor and also having output shaft means drivingly connected simultaneously to said handrail driving means and to said endless step band, said electric motor having an external rotor drivingly connected to said input shaft means and forming housing means for other parts of said electric motor and being journalled in an overhung manner on a portion of said input shaft means, said driving unit including a rigid handrail driving shaft and also including torque supporting means for simultaneously conveying the forces of the torque of said transmission means particularly to said rigid handrail driving shaft, said rotor having one circumferential surface designed simultaneously as a brake drum to save space and to assure compactness of the driving unit, a housing encasing said transmission means, and said electric motor including a stator flanged to said housing for said transmission means and simultaneously forming cover means for the mount of a part of said input shaft means.

4,227,606

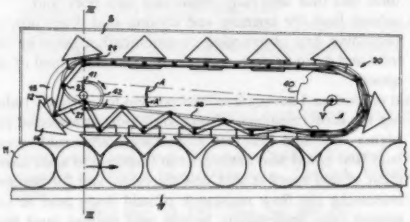
APPARATUS FOR SPACING ARTICLES MOVING IN A LINE

Hans U. Bogatzki, Ferdinand-Hodler-Strasse 24, Zurich, Switzerland

Continuation-in-part of Ser. No. 862,439, Dec. 20, 1977, abandoned. This application Feb. 27, 1979, Ser. No. 15,788

Int. Cl.[3] B65G 47/28

U.S. Cl. 198—459 **13 Claims**



1. Apparatus for uniformly spacing from each other articles (11) in a moving line (1) of such articles for facilitating processing of the articles at a processing station, the apparatus comprising:

a first elongated, endless rail system (**15**) having a first rail system section adjacent the article line (**1**) and running along generally parallel to the direction of movement of the line,

a plurality of article spacing members (**16**) guided along the first rail system,

articulated connecting arms (**21**) interconnecting the article spacing members, the connecting arms pivoting at each spacing member (**16**) and at an intermediate pivot point (**23**) between the spacing members,

a second elongated, endless rail system (**30, 30'**) having a second rail system section adjacent the first rail system section and non-parallel to the first rail system section, the first and second rail systems (**15, 30**) being adjustable relative to one another in their guidance plane, and including turn-around loop sections at their respective ends;

pivot guide means (**25**) for guiding the intermediate pivot points of the articulated connecting arms along the second rail system section,

drive means (**40**) for driving the article spacing members (**16**) along the first rail system section and engaging said article spacing members adjacent one turn-around loop of the first endless rail system;

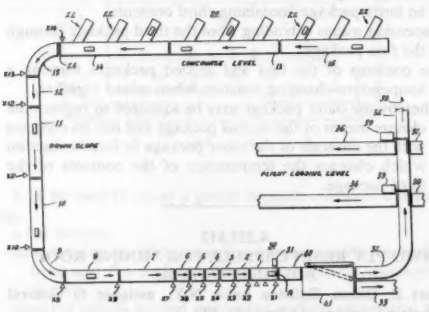
and wherein said second rail system (**30, 30'**) comprises a unitary structural element defining an elongated endless pivot guide means closed by end loops, each end loop having a center point (**V, 41'**), the diameter of the pivot guide means at the region of the end loops of the elongated endless guide means being different, the center point of one of said end loops being pivotably connected to said unitary structure, and fixed with respect to said first rail system (**15**), the center point of the other of said end loops being movable and shiftable with respect to said first rail system to permit selective positioning of the second rail system with respect to the first rail system.

4,227,607

HIGH VOLUME METHOD AND SYSTEM FOR DYNAMICALLY STORING ARTICLES FOR SORTING AND ROUTING

Peter P. Malavenda, 5 Colonial Ct., Armonk, N.Y. 10504

Filed Apr. 16, 1979, Ser. No. 30,081
Int. Cl.³ B65G *43/10*
U.S. Cl. 198—460 **22 Claims**



13. Dynamic storage method for automatically storing individual articles on a conveyor system comprising a series of individually operable conveyors arranged in a continuous path for the transport of the articles between input conveyor means and a downstream station including a plurality of short buffer conveyors with a plurality of intermediate conveyors arranged end-to-end between said input conveyor means and said buffer conveyors comprising the steps of:

(a) simultaneously activating all of said intermediate conveyors and all of said buffer conveyors for operating said conveyor system in a conventional transport mode;

(b) placing incoming articles on said input conveyor means to be transported via said intermediate conveyors to said buffer conveyors near said downstream station;

(c) sensing for the presence of an article near the downstream end of each of said short buffer conveyors;

(d) sensing for the presence of an article near the downstream end of each intermediate conveyor;

(e) selectively stopping the downstream buffer conveyor and each preceding buffer conveyor when a stored article is sensed as being present near the downstream end of the respective buffer conveyor;

(f) deactivating said intermediate conveyors when all of said buffer conveyors have articles sensed as being present thereon and have been stopped, thereby placing the system in a dynamic storage mode of operation, while allowing said input conveyor means to continue running;

(g) sensing the presence of each incoming article near the downstream end of said input conveyor means;

(h) selectively briefly activating the first intermediate conveyor until each such sensed incoming article has been removed from the downstream end of said input conveyor means and has been transferred onto the upstream end of the first intermediate conveyor;

(i) selectively briefly activating each succeeding intermediate conveyor whenever an article is sensed as being present near the downstream end of the preceding intermediate conveyor,

thereby progressively filling available space on the respective intermediate conveyors with articles slightly spaced one from another as incoming articles are fed from the input conveyor means;

(j) returning to the conventional transport mode of operation when the upstream buffer conveyor is cleared of the article temporarily stored thereon; and

(k) deactivating the input conveyor means whenever it happens that the available space on all of the intermediate conveyors has become full of temporarily stored articles.

4,227,608

METHOD AND AN ARRANGEMENT FOR OBTAINING A TRANSLATORY MOVEMENT BETWEEN TWO MUTUALLY CONTACTING BODIES

Björn J. V. Alfthan, Högbergsgatan 46, S-116 20 Stockholm, and Karl G. Pettersson, Katarina Bangata 43, S-116 39 Stockholm, both of Sweden

Filed Dec. 27, 1978, Ser. No. 973,597
Claims priority, application Sweden, Jan. 13, 1978, 78003910
Int. Cl.³ B65G *35/00*; B62D *57/02*
U.S. Cl. 198—630 **13 Claims**

1. A method of obtaining a translatory movement between two mutually contacting bodies, wherein at least one wave is caused to move along at least one active portion of at least one of said bodies,

said portion being in contact with the other of said bodies, and wherein the wave either causes an interruption in said contact between said bodies and separates two parts of said active portion which is in contact with the other of said bodies, or forms a contact between said bodies and separates two parts of said active portion which are not in contact with said other body,

thereby causing the distance between two arbitarily selected points of respective pairs of said parts measured along the

surface of the active portion to be longer than the shortest distance between said points;

and including the step of

advancing the waves by means of at least one roll which is displaced relative to the active portion.

4,227,609

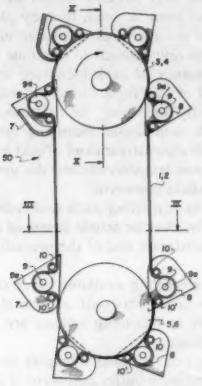
BUCKET CONVEYOR

Roland Günther, Wesel, and Karl H. Koster, Essen, both of Fed. Rep. of Germany, assignors to Gutehoffnungshütte Sterkrade A.G., Fed. Rep. of Germany

Filed Mar. 9, 1979, Ser. No. 18,861

Int. Cl.³ B65G *17/36, 25/00*

U.S. Cl. 198—711 **6 Claims**



1. A bucket conveyor, comprising a drive pulley, at least one guide pulley, endless traction cable means engaged over said drive pulley and said guide pulley, a conveyor trough having an axle, a bucket pulley on said axle, a guide pin on said trough on each side of said axle, said endless traction cable means including a cable trained around each guide pin having a loop engaged over said bucket pulley between said pins to secure said bucket pulley to said cable, wherein said bucket pulley is rotatably mounted on said axle.

4,227,610

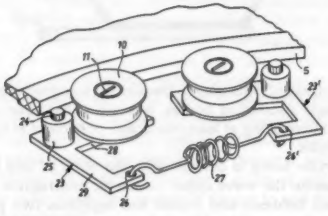
CURVED BELT CONVEYOR

Heinz Gerdes, Hamburg, and Karl-Günther Blättermann, Hamburg-Rahlstedt, both of Fed. Rep. of Germany, assignors to Conrad Scholtz AG, Hamburg, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,096

Int. Cl.³ B65G *15/02, 15/60*

U.S. Cl. 198—831 **5 Claims**



1. In a curved conveyor having a generally planar ring shaped belt, and means for supporting the belt and for guiding the belt along a closed path of travel having first and second generally parallel, spaced apart runs with an inner peripheral edge of the belt substantially defining an arc of a circle about a predetermined center, the improvement in said supporting and guiding means comprising a plurality of guide roller means for engaging said inner peripheral edge of said belt, means mounting said roller means adjacent said arc and for individual independent movement radially of said arc, and means operatively connected with said mounting means and said roller means for resiliently biasing each of said roller means radially outwardly against said edge of said belt, said means for resiliently biasing said roller means comprising a plurality of leaf spring means, each said leaf spring means having spaced end portions for rotatably supporting an adjacent pair of said roller means, and means for stationarily supporting each of said leaf spring means at points thereof intermediate said end portions.

4,227,611

PACKAGE

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

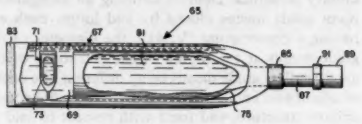
Division of Ser. No. 739,476, Nov. 8, 1976, Pat. No. 4,093,067.

This application Jan. 27, 1978, Ser. No. 872,895

The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—219 **7 Claims**



1. A composite package comprising

an outer package forming a first package made of flexible material and forming a first chamber containing first contents,

a first closure means sealing the first contents in the first package,

an inner package forming a second package contained within said first chamber and containing second contents,

a second closure means sealing said second contents of said second package,

the closure means of the second package being weaker than the closure means of the first package,

a third package contained within said first chamber to form an inner package containing third contents,

dispensing means extending from the third package through the first package,

the contents of the first and second packages forming a temperature-changing reaction when mixed together,

whereby the outer package may be squeezed to rupture the closure means of the second package and mix its contents with the contents of the outer package to form a reaction which changes the temperature of the contents of the third package.

4,227,612

TWO-PLY RESIN CAPSULE FOR MINING ROOF BOLTING SYSTEMS

Robert E. Dillon, Ballston Lake, N.Y., assignor to General Electric Company, Gainesville, Fla.

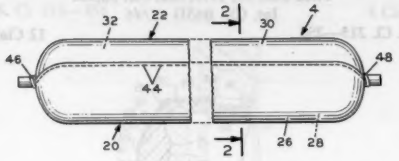
Filed Jun. 19, 1979, Ser. No. 50,065

Int. Cl.³ B65D *85/68*

U.S. Cl. 206—219 **11 Claims**

1. A multi-compartment capsule having a longitudinally extending tubular inner compartment for containing a catalyst and a longitudinally extending tubular outer compartment around said inner compartment for containing a resin composition which, when mixed and reacted with said catalyst sets and becomes a hardened mass, said compartments being fromed by a two-ply film strip having at least one ply of thermoplastic

material, said two-ply film strip having a first longitudinally extending portion in which said thermoplastic material is on one side of said strip and a second longitudinally extending portion in which said thermoplastic material is on the opposite side of said strip, said thermoplastic sides of said film strip being overlapped and welded to each other along a longitudinally extending edge, said two-ply strip material being folded back upon itself along an edge spaced from said longitudinally



extending welded edge so that the thermoplastic side of said strip at said folded edge is in contact with and welded to the thermoplastic side of said strip and forms said longitudinally extending tubular inner compartment and said opposite edge of said two-ply strip being folded around said tubular inner compartment so that the thermoplastic side of said strip at said opposite edge is in contact with and welded to the thermoplastic side of said strip and forms said longitudinally extending tubular outer compartment.

4,227,613

LID FOR GOODS DISPATCH CONTAINER

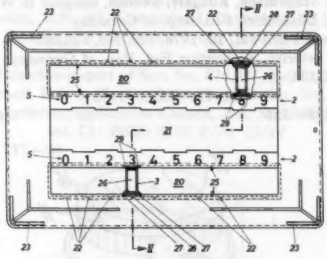
Peter Seitz, Ledderhose Weg, 6550 Bad Kreuznach, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,980

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728734

Int. Cl.[3] **B65D** *43/03, 73/00;* **G09F** *3/20*

U.S. Cl. 206—459 **3 Claims**



1. A lid used to cover a goods dispatch container comprising:

a flat surface,

substantially parallel opposing recessed walls extending from said flat surface, defining at least one rectangular groove,

marking indicia located on the flat surface adjacent to and spaced along said groove;

at least one rectangular marking piece shaped to fit within the groove and of a size such that it can be positioned adjacent only one marking indicia at a time, and of a thickness so that it fits within the groove to be flush with the flat surface;

at least one pair of resilient support arms attached to an end of the marking piece adjacent a wall of a groove and urging against the wall of the groove;

a lip extending about the periphery of the flat surface and protruding in a direction normal to the flat surface for engaging the outer periphery of the open end of the goods dispatch container; and

at least one raised ledge portion on one of the sides of said flat surface and conforming to the periphery of the flat surface and extending at a distance from the periphery of the flat surface greater than that of the lip such that lids may be stacked so that the flat surfaces are substantially parallel to one another and the lip of a first lid rests upon the flat surface of a second lid below it and the lip of the first lid abuts the exterior surface of the raised ledge of the second lid below it.

4,227,614

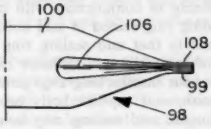
PACKAGES

Edward F. Hollander, Jr., Broomall, Pa., assignor to John P. Glass, Essington, Pa.

Division of Ser. No. 720,084, Sep. 2, 1976, abandoned. This application Sep. 1, 1978, Ser. No. 938,774

Int. Cl.[3] **B65D** *73/00, 27/08*

U.S. Cl. 206—459 **5 Claims**



4. A package comprising a cylindrical tube of flexible material, a first end of said tube being closed by a first ultrasonic seal extending transversely across the tube, a second end of said tube being closed by a second ultrasonic seal extending transversely across the tube, said tube providing an internal chamber between said seals for containing a product, and one of said end seals comprising four overlapped wall portions having a length approximately one quarter of the circumference of said tube and formed by folding a closed end of the tube about a longitudinally extending fold line on the tube circumference.

4,227,615

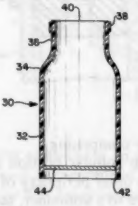
MEDICINE CONTAINER

Gervase M. Flick, Apt. 3D, Lagoon Apts., Hilton Hawaiian Village Hotel, Honolulu, Hi. 96815

Filed May 2, 1979, Ser. No. 35,287

Int. Cl.[3] **B65D** *55/02*

U.S. Cl. 215—222 **7 Claims**



1. A container for safely receiving and storing medication, comprising:

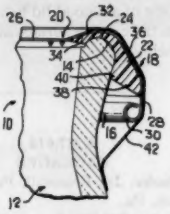
a body portion having a mouth at a top end thereof and a bottom connected to said body portion opposite said mouth, said body portion being substantially opaque and said bottom being transparent and recessed within said body portion and being completely encompassed about the periphery thereof by said body portion.

4,227,616

MOLDED GASKET PRESS-ON CLOSURE

Frank H. Lecinski, Jr., Harwood Heights, and John N. Banich, Sr., Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,934
Int. Cl.[3] B65D *41/22*
U.S. Cl. 215—246 7 Claims



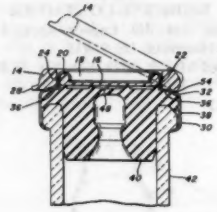
1. A closure for tumbler-like containers, said closure comprising a cap-like body including an end panel having a depending skirt defining in conjunction with said end panel a corner, and a sealing ring seated in said corner, said closure being characterized in that said sealing ring extends axially along a portion of said skirt and includes radially inwardly directed lug means for interlocking engagement with a container external finish, said cap-like body being formed of a resilient flexible metal, said sealing ring being formed of a resilient gasket material, and said skirt extending axially beyond said sealing ring in a direction away from said end panel and in radially outwardly spaced relation relative to said lug means and forming means for facilitating distortion of said sealing ring to break a seal between said sealing ring and an intended container.

4,227,617

CONTAINER CLOSURE

Leman P. Albrecht, Richmond, and W. Coy Willis, Hagerstown, both of Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 30, 1979, Ser. No. 71,318
Int. Cl.[3] B65D *41/40*
U.S. Cl. 215—251 7 Claims



1. A closure assembly comprising:

a ferrule having a top annular portion and a skirt portion depending from the outer periphery of the top portion for securing said closure to a container, said top portion having at least one upwardly projecting locking portion on the periphery of a central opening defined by said top annular portion, and a weakening line radially outwardly of said locking portion and concentric with the central opening; and

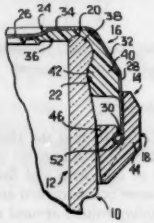
a fitment overlyingly contacting and interlocking with said ferrule, said fitment including a disk portion which is secured within the central opening of said top portion of said ferrule by said locking projection, and a concentric outer lifting ring hingedly connected to said inner disk portion.

4,227,618

EXPANSION SECTION FOR TAMPER-INDICATING RING OF SQUEEZE-OFF CLOSURE

Donald H. Zipper, Western Springs, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Jun. 21, 1979, Ser. No. 50,933
Int. Cl.[2] B65D *41/46*
U.S. Cl. 215—253 12 Claims



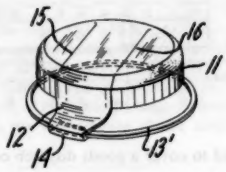
1. A closure assembly comprising a closure member including a body having an end panel and a depending skirt and a sealing ring within said body for engaging a container sealing surface, and a tamper-indicating ring carried by said skirt and having a portion disposed radially inwardly of said skirt for normally preventing radial inward deflection of said skirt, said tamper-indicating ring being characterized in that it includes expansion means for accommodating expansion of said tamper-indicating ring during heating thereof.

4,227,619

BOTTLE CAP WITH RING SHAPED TEARING ELEMENT

Sven-Ake Magnusson, Kungälv, Sweden, assignor to Wicanders GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,088
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 7802184
Int. Cl.[3] B65D *41/32*
U.S. Cl. 215—255 16 Claims



1. A tear tab closure for containers such as bottles and the like comprising a cap having a top wall, a downwardly depending skirt and score lines in the skirt and top wall defining a tear strip adapted to be torn out to open the closure, in which the improvement comprises a relatively short extension on said skirt projecting generally radially away from the bottom of the skirt and defining a tear tab at one end of said tear strip, and a finger ring formed as a separate piece secured to the free end of said tear tab in nearby relation to the bottom of said skirt to facilitate pulling the tab to tear open the closure, said tab being fastened only to the skirt and being of a length to serve only as an anchorage for said finger ring and said finger ring having an inner radius large enough to accommodate a finger of a user to

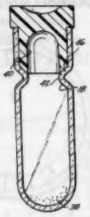
capture the ring securely with his finger with minimum effort and risk of injury.

4,227,620

SPECIMEN COLLECTING TUBE

Hugh T. Conway, Cedar Grove, N.J., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Feb. 28, 1979, Ser. No. 16,156
Int. Cl.³ B01L *3/14*; B65D *39/00*
U.S. Cl. 215—355 **4 Claims**



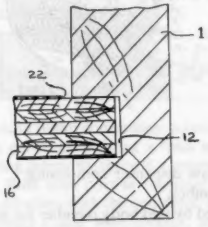
1. A specimen collection receptacle for liquids such as blood comprising: a tubular body having a closed end and an open end and a circumferential protruding portion extending interiorly from the tubular body between said closed and open ends, said protruding portion being formed by a necked-in part of the tubular body so that the interiorly protruding portion has a surface facing the open end angled toward the closed end; and a stopper sealing the open end of the tubular body, said stopper having a tapered bottom resting upon the protruding surface such that a smooth transition is formed between the exterior surface of said stopper and the interior surface of the tubular body.

4,227,621

SEALED TUB

Leslie Jones, R.R. #2, Cumberland, Canada (K0A 1S0), and Roger Paradis, 1172 Grenoble Cres., Orleans, Canada (K1C 2C6)

Continuation-in-part of Ser. No. 876,487, Feb. 9, 1978, abandoned. This application May 21, 1979, Ser. No. 40,852
Claims priority, application Canada, Jan. 31, 1978, 295988
Int. Cl.³ B65D *8/04, 8/16, 25/14*
U.S. Cl. 217—96 **3 Claims**



1. A tub comprising:

a plurality of staves disposed in edge-to-edge relation and forming a continuous wall having an inner face and an outer face;

each of said staves comprising an elongate member generally in the form of a rectangular parallelepiped having opposite elongate faces, opposite elongate edges, and opposite ends;

each of said opposite elongate edges defining along its length a formation including a substantially part-cylindrical portion;

said part-cylindrical portion having an axis which is parallel to planes defined by said opposite faces engaging a corresponding portion of the adjacent stave to define at the area of engagement a sealing zone;

means defining a rabbet in one of said elongate faces of each of said elongate members;

the rabbets extending between said elongate edges of said elongate members transversely of the lengths and between said sealing zones thereof and having side walls generally normal to the axes of said elongate members;

said rabbets being aligned to form a continuous groove in the inner side of said wall;

a floor of said tub formed by at least one floor member engaged within said groove;

said floor member comprising a laminated plywood so oriented that immersion in water causes said plywood to swell more in a direction normal to the plane of said floor member than parallel thereto, whereby sealing of said floor member to said rabbet side walls without displacement of said elongate members outwardly of said tube is promoted;

elongate means extending around said elongate members on the outer side of said wall for retaining said staves in place, and

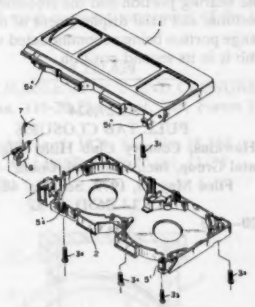
said floor member having a water resistant protective coating which terminates inwardly of said inner face of said continuous wall to expose the uncoated plywood and thereby to promote localized swelling of said floor member in said direction.

4,227,622

TAPE CASSETTE

Masatoshi Okamura; Haruo Shiba, and Kimio Tanaka, all of Tokyo, Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed May 23, 1979, Ser. No. 41,880
Claims priority, application Japan, Jul. 4, 1978, 53/92194[U]
Int. Cl.³ G11B *23/06*; B65H *17/48*; B65D *6/32*
U.S. Cl. 220—4 B **6 Claims**



1. In a tape cassette comprising an upper half casing and a lower half casing which are assembled with bolts, an improvement characterized in that longitudinally slotted male hollow cylindrical projections are mounted on either of the upper half casing or the lower half casing and female hollow recesses are mounted on the other half casing at the corresponding positions and the upper and lower half casings are superposed to fit the male hollow cylindrical projections into the corresponding female hollow recesses, and self-tap bolts are screwed from the female hollow recesses into the slotted male hollow cylindrical projections to radially expand the male hollow cylindrical projections to fit the projections on the inner surfaces of the

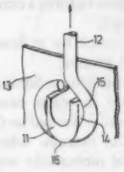
female hollow recesses, radial expansion of the male hollow cylindrical projections being facilitated by being slotted.

4,227,623

METHOD OF CONNECTING A BAIL TO A CONTAINER

Peter A. Woinarski, 162/C Queen St., Woollahra, Sydney, Australia (2025)

Filed Jan. 31, 1979, Ser. No. 7,976
Claims priority, application Australia, Feb. 24, 1978, PD3504
Int. Cl.³ B65D *25/32, 25/28*
U.S. Cl. 220—91 **4 Claims**



1. A container formed from a deformable plastics material and having a pair of diametrically opposed bail ears to which a bail can be fitted, each bail ear comprising:

(a) a bearing portion which projects outwardly from a wall of the container and which provides a pivot bearing for an eye of the bail,

(b) at least one flange portion which is formed integrally with the bearing portion, the flange portion being spaced from the container wall by the bearing portion and being arranged normally to prevent axial displacement of the eye of the bail relative to the bearing portion, and

(c) two limbs which project outwardly from the container wall,

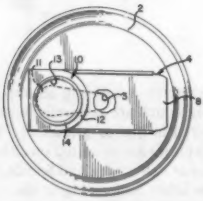
the bearing portion and the two limbs forming a U-shaped element that projects outwardly from the container wall with the bearing portion being constituted by an arcuate part of the U-shaped element, each limb having a free end that is resiliently deformable relative to the bearing portion between an unstressed first position and a stressed second position, each limb being engageable with the eye of the bail when the bail is fitted to the bearing portion and the free end of the limb is in the first position, and axial displacement of the eye of the bail past the flange portion being accommodated when the free end of each limb is in its second position.

4,227,624

PULL TAB CLOSURE

Jerry D. Hawkins, Country Club Hills, Ill., assignor to The Continental Group, Inc., Stamford, Conn.

Filed May 18, 1979, Ser. No. 40,331
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—265 **7 Claims**



1. A pull-tab comprising one elongated laminate member made of metal foil and thermoplastic film and having a body and a grasp section at one end of the body, said grasp section comprising a ring portion with a finger opening therein, a hem about the finger hole having a flange portion bent against the ring portion with the plastic film on the flange portion and the ring portion facing each other, and a heat bond between said portions forming an integral structure.

4,227,625

SEALING LID AND SEALING LID-CONTAINER COMBINATION

James L. Underwood, 104 Dixie Dr., Woodstock, Ga. 30188

Filed Aug. 17, 1979, Ser. No. 67,239
Int. Cl.³ B65D *43/10, 34/62, 1/16*
U.S. Cl. 220—307 **15 Claims**

1. A lid for closing an opening in a container wherein the lid engages an inner wall of the container, the lid comprising:

a central portion for substantially covering the opening, and

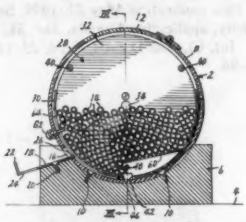
a bifucated securing portion integral with and extending from the central portion, said bifucated portion comprising a sealing flange, a web connecting the sealing flange to the central portion and locking tab means diverging from the web wherein the sealing flange extends beyond the locking tab means and the locking tab means seats behind the sealing flange for holding the sealing flange in abutment with the inner wall of the container.

4,227,626

SODA STRAW DISPENSER

John B. Merila, 6223 East 127th St., Grandview, Mo. 64030

Filed Apr. 16, 1979, Ser. No. 30,100
Int. Cl.³ B65D *83/02*
U.S. Cl. 221—188 **10 Claims**



1. A soda straw dispenser comprising:

a. a body member,

b. a bin carried by said body member for movement between first and second positions relative thereto and adapted to contain soda straws resting horizontally therein, said bin having a discharge slot through which straws may be discharged, an ejector member carried movably by said bin and obstructing said discharge slot against uncontrolled movement of straws therethrough at all positions thereof relative to said bin, said ejector comprising an open-sided container of a size to receive and contain a single straw therein, and being movably carried by said bin between a first position in which it opens inwardly into said bin to receive a straw therein, and a second position in

which it opens outwardly through said slot to discharge said single straw,

d. means biasing said bin and said ejector member yieldably to said first positions, and

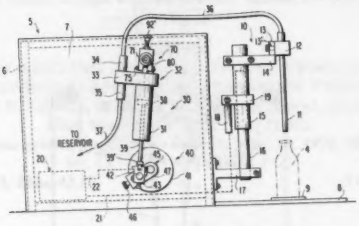
e. manually operable means for concurrently moving said bin and said ejector member from said first positions to said second positions.

4,227,627

TRIMMER ARRANGEMENT FOR FILLING UNIT OF AUTOMATIC FILLING MACHINE

Richard N. Bennett, Arbutus, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Oct. 11, 1978, Ser. No. 950,286
Int. Cl.[2] G01F *11/02*
U.S. Cl. 222—282 **14 Claims**



2. A volume-adjusting mechanism for a filling machine operable to fill containers with a predetermined amount of a product and comprising at least one filling unit having at least two parts movable relative to one another and including pump cylinder and piston means, actuating means operatively connected with one of said parts to cause relative movement between said parts and thereby provide a suction and discharge stroke for a respective filling unit, and the other part being adapted to be connected with a relatively fixed part of the filling machine, characterized by volume-adjusting means operatively connecting said other part with said relatively fixed part to enable a change in the volume of the product to be sucked-in and discharged by a respective filling unit, the volume-adjusting means including adjustable lost-motion means to selectively vary the lost motion between said other part and said relatively fixed part during the suction and discharge stroke of the filling unit.

4,227,628

FLUID DISPENSING PUMP HAVING AXIALLY DEFORMABLE VALVE

Frederick L. Parsons, 759 Morningside Rd., Ridgewood, N.J. 07450

Filed Feb. 23, 1979, Ser. No. 14,346
Int. Cl.[3] B05B *11/02*
U.S. Cl. 222—380 **7 Claims**

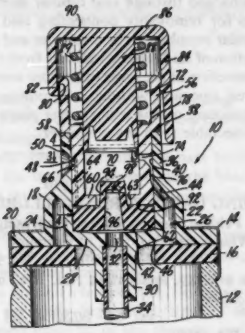
1. A fluid dispensing pump comprising: a housing adapted to be connected to a container holding a fluid to be dispensed, said housing defining interiorly thereof a generally cylindrical bore having (1) a fluid inlet port in the axial inner end wall thereof for communication with the container, (2) a fluid outlet port opening through a side wall thereof, and (3) an open axially outer end;

a generally cylindrical barrel received within the open outer end of said bore, the axially inner end wall of the barrel being spaced from the axially inner end wall of the bore to define therebetween a generally cylindrical valve chamber, said barrel defining interiorly thereof a generally cylindrical pumping chamber having (1) at least one opening through the axially inner end wall thereof for communicating with the valve chamber and (2) an open axially outer end;

a generally cylindrical piston received within the open outer end of said pumping chamber for reciprocation therein between an axially outer position and an axially inner position;

resilient means for returning said piston to said axially outer position;

a resilient, generally cylindrical valve member located in said valve chamber and having (1) an axial passageway therethrough for establishing fluid communication between the inlet port in the housing and said pumping chamber and (2) a generally circular sealing lip on the axially outer end wall thereof for establishing, in the relaxed state of said valve member, a fluid-tight seal with the



axially inner end wall of the barrel in surrounding relation to said at least one opening therethrough, said valve member being axially deformable from said relaxed state in response to the build up of fluid pressure within said pumping chamber by reciprocation of said piston to an inwardly deflected state at which said sealing lip is at least partially out of engagement with the inner end wall of the barrel, thereby permitting fluid flow from the pumping chamber to the outlet port; and

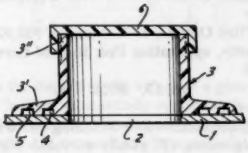
check valve means for (1) closing the passageway through the valve member upon inward movement of the piston and (2) opening said passageway to permit fluid flow therethrough upon outward movement of the piston.

4,227,629

DETACHABLE SPOUT AND CLOSURE

Abraham Froyman, 110-20 Flave Apt. 308, Forest Hills, N.Y. 11375

Filed Mar. 7, 1979, Ser. No. 18,464
Int. Cl.[3] B65D *5/72, 25/40, 35/38*
U.S. Cl. 222—566 **15 Claims**



1. A device for closing an opening of a container comprising a tubular member having an axis, an inner hollow and two open end portions, one of said end portions of said tubular member being connectable with a container in the region of its opening so that said tubular member firmly surrounds the opening of the container and said inner hollow of said tubular member communicates with the interior of said container through the opening, said one end portion of said tubular member being connectable to the container

directly and removably so that said tubular member can be disconnected from the container and connected with another such container;

a closing member for closing the other end portion of said tubular member and movable between a closed position in which said closing member is associated with said other end portion of said tubular member so as to close the same whereby a material accommodated in the interior of the container cannot be discharged from the latter and access to the interior of the container is prevented, and an open position in which said closing member is withdrawn from said other end portion of said tubular member whereby the material from the interior of the container can be discharged through said tubular member; and

means for removably connecting said one portion of said tubular member to the container and allowing the disconnection of said tubular member from the container and the connection of the same to another container having unprepared opening without any connecting elements, said connecting means being a one piece member removably connectable with the container.

4,227,630

SLIDING GATES FOR METALLURGICAL VESSELS

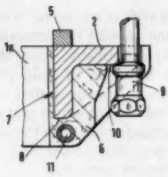
Hans R. Fehling, Geneva, Switzerland, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,241

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1977, 2732094

Int. Cl.[2] B22D *41/08*

U.S. Cl. 222—600 **14 Claims**



1. A frame for a sliding gate for an outlet of a metallurgical vessel comprising a refractory concrete member reinforced with at least one metal element having at least one lateral securing lug, said metal element being a metal frame embedded in the refractory concrete member, said concrete covering the inner, outer and under sides of the frame up to the lateral securing lug.

4,227,631

VALVE FOR A SPRAY CONTAINER

Hilmar Schneider, Erlenweg 11, D-6201 Oberjosbach, Fed. Rep. of Germany

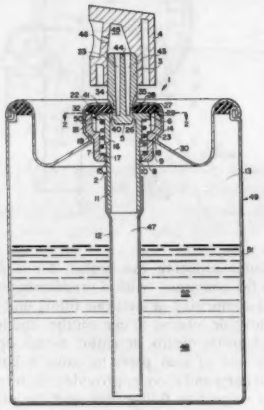
Filed Oct. 23, 1978, Ser. No. 953,921

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748736

Int. Cl.[3] B05B *7/32*

U.S. Cl. 222—635 **14 Claims**

1. In a spray container valve including valve housing means (9), valve body means (2) axially movable within said valve housing means, hollow stem means (3) operatively connected to said valve body means, spray head means (4) operatively connected to said hollow stem means, spring means (17) within said valve housing means and operatively connected to said valve body means (2) for biasing the valve body means into a closed position, sealing means (27), hollow valve member means (11) operatively connected to said valve body means (2) opposite said hollow stem means (3), said hollow stem means extending through said sealing means, outer circumferential groove means (26) in said hollow stem means forming a seat for said sealing means, first passage means (34) into said hollow stem means, said first passage means being openable and closable by said sealing means, the improvement comprising a bottom opening (10) in said valve housing means, said hollow valve member means extending through said bottom opening with clearance (15), guide means (21) in said valve housing means, chamber means (14) defined by said valve housing means (9) and by said valve body means (2) to form a throttling chamber means, said clearance (15) and chamber means (14) permitting propellant to flow through the valve housing, second passage means (41) openable and closable by said sealing means and extending from said chamber means toward said first passage means, third passage means (40) extending from within said hollow valve member means (11) for cooperation with said second passage means (41) in the manner of a jet pump whereby active ingredient is drawn through said third passage means (40) for mixing with propellant coming through



said second passage means (41) and whereby the active ingredient propellant mixture flows through said first passage means (34) into said hollow valve stem, said valve body means comprising intermediate wall means (5) including flange means (6) forming an integral structure with said hollow stem means (3) and with said hollow valve member means (11), said hollow stem means (3) comprising first and second (33, 43) longitudinal channels, said outer circumferential groove (26) in said hollow stem means being substantially adjacent said intermediate wall means, said first passage means (34) extending through said circumferential groove into one of said longitudinal channels, said valve further comprising fourth passage means (35) also extending through said circumferential groove but remote from said first passage means (34), whereby additional propellant is supplied into the other longitudinal channel of said hollow valve stem means.

4,227,632

FLEXIBLE GARMENT HANGER

John H. Collis, P.O. Box 26093, Houston, Tex. 77027

Filed Jun. 8, 1978, Ser. No. 913,623

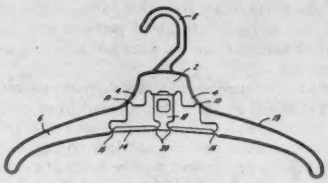
Int. Cl.[3] A47J *51/10*

U.S. Cl. 223—94 **13 Claims**

1. A flexible garment hanger including a body having two sides, a hanger arm projecting from either side of body such that both hanger arms and the body are substantially within a single plane and a hook member connected to said body further comprising,

(a) means for flexibly connecting one end of each hanger arm to its corresponding body side such that both hanger arms can be extended into a deployed position and deflected downwardly into a collapsed position;

(b) an elongated locking bar having two ends, each end thereof flexibly secured to the corresponding hanger arm;



(c) overcenter stop means flexibly secured to the locking bar, and;

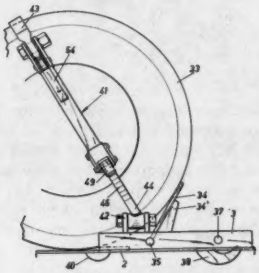
(d) a means to urge the stop member against the body.

4,227,633

WHEEL-LOCKING DEVICE TO SECURE VEHICLES ON THE CARGO PLATFORM OF TRANSPORT VEHICLES

Jan B. R. Sellberg, Banvägen 15, S-230 50 Bjärred, Sweden

Filed Mar. 19, 1979, Ser. No. 21,813
Claims priority, application Sweden, Mar. 20, 1978, 7803163
Int. Cl.³ B60R *9/00*; B65J *1/22*
U.S. Cl. 224—42.28 **3 Claims**



1. An improved wheel-locking device for securing vehicles on the movable cargo platform of transport vehicles, comprising a stop member arranged to be raised from said movable platform for engagement with one of the wheels of said vehicle, a bow intended to be applied over said vehicle wheel, a shoulder supporting said stop member in the raised position of the latter and preventing further pivoting of said stop member, a telescopically extensible arm at the outer end of which said bow is pivotally mounted, said telescopically extensible arm comprising a controllable blocking mechanism arranged to prevent extension of said telescopic arm beyond a pre-determined, set vertical position but at the same time to allow retraction of said arm, said bow, in its applied position over the tyre of said vehicle wheel, resting on said wheel and supporting said arm in its set vertical position, as a consequence of the weight of the movable part of said arm and its own weight, the improvement comprising

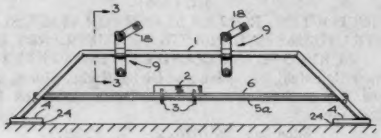
said telescopic arm being pivotally mounted at its lower point of attachment and being so directed that said arm, in its raised position for the puprose of application of said bow over said vehicle wheel, forms an acute angle to a vertical plane extending at right angles to the arm pivot axis through said point of attachment of said arm and is positioned on the opposite side of said vertical plane relative to the plane formed by said raised stop member, whereby said vehicle wheel will be secured between said bow and said stop member.

4,227,634

PORTABLE CONTAINER CARRYING RACK FOR BED-TYPE DELIVERY VEHICLE

Harley L. Ramsey, and Harley M. Ramsey, both of 3011 W. 76th St., Los Angeles, Calif. 90043

Filed Jul. 16, 1979, Ser. No. 57,908
Int. Cl.³ B60R *11/00*
U.S. Cl. 224—42.45 R **5 Claims**



1. A portable container carrying rack, comprising:

a. a free-standing frame supported on a base, having a slab with spaced openings;

b. a pair of similarly shaped parallel side bars having ends that connect to the base, and then from the base extend upwardly into a generally straight central section above and straddle of the slab;

c. adjustable restraining means extending between, and moveable along, the parallel side bars for engaging the sides of containers being transported;

d. a block having a top and a bottom side, with two or more pegs extending vertically from the bottom of the block that have diameters equal to, or less than the space openings in the slab and are positioned to correspond to the spaced openings in the slab;

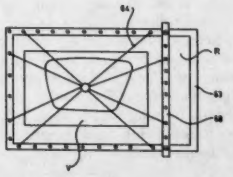
e. lockable means for locking the adjustable restraining means at any location along the parallel side bars.

4,227,635

APPARATUS FOR THE MANUFACTURE OF A WINDOW BY DETACHMENT OF THE EDGES OF A SHEET OF GLASS ALONG A SCORE

Jean-Pierre Delettre, Thourotte, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jul. 10, 1978, Ser. No. 923,168
Claims priority, application France, Jul. 21, 1977, 77 22349
Int. Cl.³ C03B *33/04*
U.S. Cl. 225—96.5 **17 Claims**



1. Apparatus for detaching the edges of a glass sheet from a closed pattern having substantially rectilinear portions and a number of corners therebetween whose perimeter is defined by a cut-off line incised in the surface of the glass sheet comprising

(a) a frame including a plurality of elements circumscribing an open area,

(b) elastic means including a plurality of elastic straps joined together at one end and each strap supported at the other end by one of said frame elements to be disposed within said open area, said elastic straps arranged in pairs equal in number to the number of corners in said closed pattern, and said elastic straps of each pair extending across said cut-off line within a substantially rectilinear portion on opposite sides of and near each corner to bear on the edges of said glass sheet contiguous to said rectilinear portion,

(c) means for supporting said glass sheet within the area of said closed pattern, and

(d) means for moving at least one of said frame and supporting means toward the other whereby during movement said elastic means contacting the edges of said glass sheet exert a force to cause said edges to flex about and detach from said closed pattern at said cut-off line.

4,227,636

SUPPORTING ROLLER STAND FOR STEEL SLAB STRAND CASTING PLANTS, PARTICULARLY FOR CURVED SLAB STRAND CASTING PLANTS

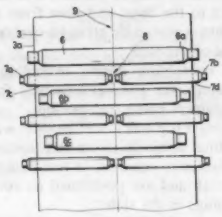
Werner Rahmfeld, Mulheim, and Dieter Kothe, Moers, both of Fed. Rep. of Germany, assignors to Demag A.G., Fed. Rep. of Germany

Filed Sep. 28, 1976, Ser. No. 727,573

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1975, 25445561

Int. Cl.[2] B65H *17/22*

U.S. Cl. 226—189 **5 Claims**



1. Roller stand support apparatus for steel slab strand casting plants and particularly curved slab strand casting plant, comprising

(a) a plurality of pairs of spaced apart supporting rollers positioned to define a supporting path for a cast strand on each side thereof;

(b) power means connected to at least some of the supporting rollers for driving said rollers;

(c) at least some of said plurality of rollers on at least one side of said path being a plurality of coaxially arranged rollers;

(d) said roller pairs being positioned according to their diameters; the improvement characterized by

(e) said supporting rollers being alternately of larger and smaller diameter along the said path;

(f) said smaller diameter rollers being said plurality of coaxially arranged rollers;

(g) the combined length of the supporting surface of each group of coaxially arranged smaller diameter rollers being greater than the length of the supporting surfaces of the said larger diameter rollers, and

(h) the length of said supporting surfaces of said larger diameter rollers being equal to or less than the width of the strand supported.

4,227,637

PNEUMATIC FASTENING TOOL

Harry M. Haytayan, Sunnyside La., Lincoln, Mass. 01773

Filed Nov. 30, 1978, Ser. No. 964,955

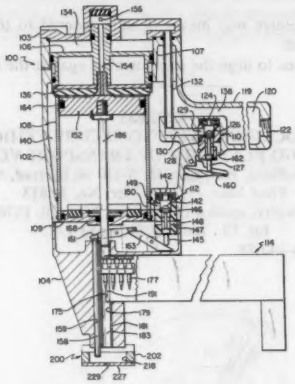
Int. Cl.[3] B27F *7/02*

U.S. Cl. 227—8 **14 Claims**

1. Apparatus for holding and attaching parts to a workpiece comprising a driver and a parts holder attached to said driver;

said driver comprising a nozzle having an end surface and an internal hammer travelway terminating in an opening in said end surface, means including a side opening in said nozzle for positioning a fastener in said travelway, operating means for causing said hammer to move through a drive stroke and a return stroke along said travelway so that said hammer can drive a fastener out of said travelway via said opening, and safety means for preventing said operating means from causing said hammer to move through said drive stroke until said safety means is operated, said safety means comprising an actuating member in said nozzle and protruding from said end surface arranged to release said safety means when said actuating member is depressed;

said parts holder comprising a part support member located adjacent to and movably spaced apart from said end surface and adapted to support in the path of movement of said hammer and in adjacent and confronting relation with a workpiece a part intended to be fastened to said workpiece, and means carried by said nozzle for movably sup-



porting said part support member for movement toward and away from said end surface of said nozzle so that when said part support member is positioned so that said part or said part support member is contacted with said workpiece said part support member may be moved toward said end surface a selected amount sufficient to cause said workpiece, said part support member or a part supported by said part support member to contact and depress said actuating member, whereby said driver may be operated to drive a fastener out of said hammer travelway into a workpiece with said fastener penetrating the part held by said part support member as it is discharged from said travelway.

4,227,638

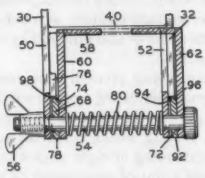
RETRACTABLE CLINCHING ANVIL STAPLER

Conrad R. Medina, Skokie, and Wifredo L. Ramiro, Homewood, both of Ill., assignors to Spotnails, Inc., Rolling Meadows, Ill.

Filed Jan. 10, 1979, Ser. No. 2,363

Int. Cl.[2] B25C *7/00*

U.S. Cl. 227—155 **6 Claims**



1. In a stapler having a frame, an anvil for clinching staples, an anvil support arm, and pivot means mounting said support arm on said frame for rotational movement about the axis of

said pivot means to and between a first clinching position and a second non-clinching position, the improvement comprising:

(a) first and second positioning stops on said frame,

(b) first and second cooperating stops on said arm for cooperation respectively with said first and second positioning stops,

(c) said first cooperating stop engaging said first positioning stop in said first position of said anvil to maintain said arm and said anvil in said first clinching position,

(d) said second cooperating stop engaging said second positioning stop to maintain said arm and said anvil in said second non-clinching position, and

(e) said pivot means mounting said anvil support arm to said frame also providing for relative movement axially of said pivot means of said frame and said anvil support arm to engage and disengage said cooperating stop with said positioning stop thus permitting movement of said arm to and between said first and second positions.

4,227,639

METHOD OF MAKING A GAS-TIGHT JOINT BETWEEN A CORRUGATED HIGH QUALITY STEEL TUBE AND A HIGH QUALITY STEEL SLEEVE

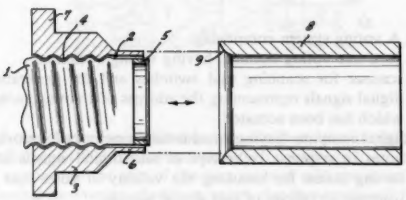
Günther Blumenberg, Hanover, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,369

Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724311

Int. Cl.[2] B23K *9/02, 5/02*

U.S. Cl. 228—173 F **4 Claims**



1. Method of making a gas-tight joint between a helically, internally, and externally corrugated, relatively thin-walled tube and a sleeve having a thicker wall; the tube and the sleeve being made of a high-quality steel, comprising the steps of:

providing a sleeve having internal threading, corresponding to a helical corrugation of the tube, the sleeve further having an unthreaded, tubular welding extension;

de-corrugating a portion of the tube adjacent to one end to obtain a smooth wall tube portion, the corrugation continues beyond the smooth wall portion;

causing the welding extension to be in intimate contact with the smooth wall tube portion and for an axial length, being displaced from the axial end of the smooth wall tube portion; and

fusion welding the welding sleeve to the smooth wall tube portion by melting a portion of the welding sleeve for fusing with the tube.

4,227,640

SELF LOCKING TRAY AND BLANK FOR FORMING SAME

Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed May 7, 1979, Ser. No. 36,742

Int. Cl.[3] B65D *5/02, 5/36*

U.S. Cl. 229—41 C **7 Claims**

1. A planar unitary blank for forming a self-locking tray comprising:

a rear central panel with a left side, a right side, a top and a bottom;

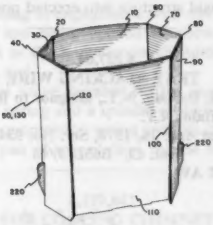
a left rear panel with a left side, a right side, a top and a bottom, the right side of the left rear panel being hingedly secured to the left side of the rear central panel by a first fold line;

a first left front panel with a left side, a right side, a top and a bottom, the right side of the left front panel being hingedly secured to the left side of the left rear panel by a second fold line;

a right rear panel with a left side, a right side, a top and a bottom, the left side of the right rear panel being hingedly secured to the right side of the rear central panel by a third fold line;

a right front panel with a left side, a right side, a top and a bottom, the left side of the right front panel being hingedly secured to the right side of the right rear panel by a fourth fold line;

a front central panel with a left side, a right side, a top and a bottom, the left side of the front central panel being hingedly secured to the right side of the right front panel by a fifth fold line;



a second left front panel with a left side, a right side, a top and a bottom, the left side of the second left front panel being hingedly secured to the right side of the front central panel by a sixth fold line;

a trapezoidal bottom rear panel with a short base, a long base and two sides, the short base of the bottom rear panel being hingedly secured to the bottom of the rear central panel by a horizontally elongated seventh fold line;

a horizontally elongated rear mid-central panel with a top edge, a bottom edge and two ends, the bottom edge being hingedly secured to the long base of the bottom rear panel by a horizontally elongated eighth fold line;

a trapezoidal bottom front panel with a long base, a short base and two sides, the short base of the bottom panel being hingedly secured to the bottom of the front central panel by a horizontally elongated ninth fold line; and,

a horizontally elongated front mid-central panel with a top edge, a bottom edge and two ends, the bottom edge being hingedly secured to the long base of the bottom front panel by a horizontally elongated tenth fold line.

4,227,641

PARTITION STRUCTURE

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 11, 1980, Ser. No. 120,630

Int. Cl.[3] B65D *5/48*

U.S. Cl. 229—42 **9 Claims**

1. A self-erecting structure, formed of a unitary blank of foldable paperboard or the like, for forming three cells within an outer shipping container or wrapper, comprising:

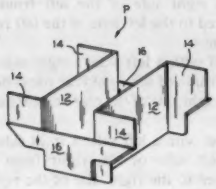
(a) a bottom center panel;

(b) a pair of opposed side panels foldably joined at their lower edges to opposed side edges of said center panel and upstanding therefrom;

(c) opposed pairs of inner end panels foldably joined at their

inboard edges to end edges of related side panels and extending outboardly therefrom and normal thereto;

(d) a pair of opposed outer end panels foldably joined at their lower edges to related end edges of said center panel and extending upwardly therefrom outwardly adjacent related inner end panels;



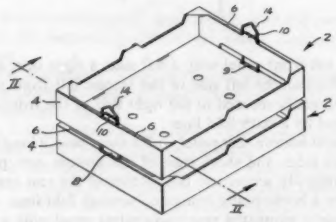
(e) each of said outer end panels having opposed lower edges separated from related inner end panels and having opposed upper edges joined to related inner end panels along fold lines which diverge upwardly to facilitate automatic folding of said structure into erected position.

4,227,642

TRAY STACKING WIRE

Stanley G. Ortel, Buffalo, N.Y., assignor to Better Wire Products, Inc., Buffalo, N.Y.

Filed Aug. 16, 1978, Ser. No. 934,216
Int. Cl.[3] B65D *5/46*
U.S. Cl. 229—52 AW **4 Claims**



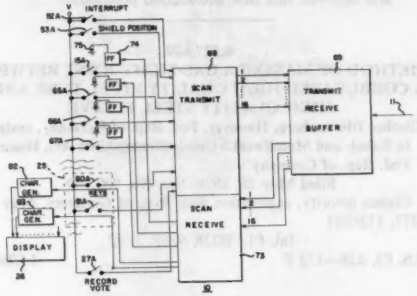
1. A unitary stacking wire in combination with a corrugated paperboard stacking tray and the like, said tray being of spaced, double wall construction having a top edge bridging said double wall construction, said top edge defining an elongated slot type aperture of trapezoidal shape extending thereealong for reception therethrough of said wire for engagement between the walls of said double wall construction, said stacking wire including a pair of legs and a bight portion with corresponding ends of said legs being joined by said bight portion into a substantially planar U-shape configuration, each of the non-joined ends of said legs terminating in a foot and prong extending from each respective leg, each said foot being unidirectional and extending in opposite direction with respect to one another substantially within the plane of said legs and bight portion, and each of said feet terminating in a prong extending laterally from corresponding sides of said feet wherein said prongs lie in a plane disposed at a substantial angle to the plane of said legs and said bight portion, said feet and prongs being disposed between the walls of said double wall construction at a point normally below said top edge whereby said prongs engage one wall of said double wall construction to resist movement of said wire relative thereto with said feet normally projecting underneath the ends of said slot type aperture, and the plane of said legs and bight portion being disposed substantially parallel to the plane of the other wall of said double wall construction along the long side of said trapezoidal aperture with said feet and portions of said legs respectively adjacent thereto being in engagement with said other wall of said double wall construction, said prongs and feet being dimensioned and arranged so that said feet are pressed against said other wall.

4,227,643

ELECTRONIC VOTING MACHINE

Henry D. Luther, Massillon, Ohio, assignor to R. F. Shouptronics Corp., Bryn Mawr, Pa.

Division of Ser. No. 724,120, Sep. 17, 1976, Pat. No. 4,178,501.
This application Oct. 30, 1978, Ser. No. 956,110
Int. Cl.[3] G07C *13/00*
U.S. Cl. 235—54 F **5 Claims**



1. A voting system comprising:

at least one voting terminal having voting switches,

a scanner for scanning said switches and for generating digital signals representing the address of a voting switch which has been actuated,

a digital computer having an addressible memory for storing votes in response to receipt of said digital signals and having means for checking the validity of votes cast in response to receipt of said digital signals,

means for transmitting digital signals from said computer to said terminal representing the address of a voting switch which has been validly operated,

a plurality of light indicators, one light indicator being associated with each voting switch;

means responsive to received digital signals for energizing the indicator associated with the voting switch which has been validly operated before the vote is recorded,

a record switch operable after a plurality of said indicators have been energized to store said votes in said addressible memory.

4,227,644

DOCUMENT FEED APPARATUS

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

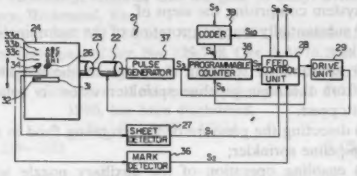
Filed Jun. 15, 1978, Ser. No. 915,965
Claims priority, application Japan, Jun. 16, 1977, 52-70492; Jun. 16, 1977, 52-70494
Int. Cl.[2] G06C *11/10;* **G06K** *7/10;* **B41J** *11/48*
U.S. Cl. 235—433 **23 Claims**

15. A document feed apparatus comprising:

mark detector means for detecting a stop mark on a document; and

feed means for feeding the document relative to the mark detector means;

the stop mark comprising two parallel lines extending perpendicular to the direction of movement of the document,



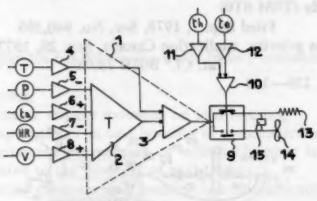
the mark detector means being constructed to detect the two lines individually.

4,227,645

ELECTRONIC AIR CONDITIONER

Bertran de La Farge, Toulouse, and Alain Vincent, Fenouillet, both of France, assignors to Institut Technique Du Porc, Paris, France

Filed Jun. 19, 1978, Ser. No. 917,043
Claims priority, application France, Jun. 17, 1977, 77 18678
Int. Cl.³ F24F *7/00*
U.S. Cl. 236—49 **18 Claims**



1. Apparatus for conditioning the air in an interior space in such manner that the parameters which contribute to a feeling of comfort on the part of the occupants of said space and the physical parameters of said occupants simultaneously satisfy an experimental condition of optimum comfort, said apparatus comprising:

at least one computer means connected to

(i) a group of means for measuring said parameters contributing to said feeling of comfort and transmitting a signal proportional to said parameters;

(ii) a group of means for displaying said physical parameters of said occupants of said space and transmitting a signal proportional to said parameters;

(iii) a group of adjusting means capable of modifying, during operation, at least one said parameter contributing to said feeling of comfort,

said computer means comprising means for controlling at least one of said adjusting means to adjust at least one said parameter contributing to said feeling of comfort in response to said signals transmitted by said means for measuring and said means for displaying, to satisfy said condition.

4,227,646

TEMPERATURE-RESPONSIVE VALVE

William B. Hart, Ipswich, and Reginald T. Williams, Hadleigh, both of England, assignors to Delta Materials Research Limited, Ipswich, England

Filed Nov. 30, 1978, Ser. No. 964,934
Int. Cl.³ G05D *23/02*
U.S. Cl. 236—93 R **12 Claims**

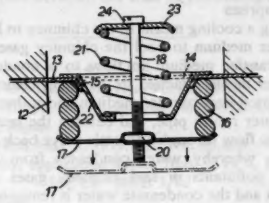
1. A temperature-responsive valve comprising:

(a) means for constituting a passage for the flow of fluid;

(b) a valve member mounted relative to said passage to control the flow of fluid;

(c) said valve member including a helically wound spring having a plurality of turns and being made of a shape memory effect material having an elastic modulus which varies significantly with temperature in a reversible manner over a transition temperature range;

(d) wherein the spacing of adjacent turns of said helically wound spring varies with temperature in said range whereby the flow of fluid between said turns is controlled;



(e) said turns being in engagement with one another at one temperature and being opened to allow flow of fluid therethrough as the temperature changes from said one temperature; and

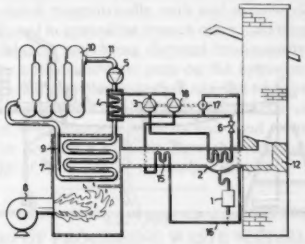
(f) wherein said valve member further includes a biasing compression spring and a spindle operatively connecting said biasing compression spring and said helically wound spring via a pair of spaced discs carried by said spindle.

4,227,647

DEVICE FOR COOLING CHIMNEY GASES

Leif Eriksson, Abrahamsbergsvagen 68, S-161 45, Bromma, Sweden

Filed May 22, 1978, Ser. No. 908,220
Claims priority, application Sweden, May 25, 1978, 7706116; Dec. 7, 1978, 7713882
Int. Cl.³ G05D *23/00*
U.S. Cl. 237—2 B **5 Claims**



1. An apparatus for cooling chimney gases from a fuel heated boiler and for removing sulphurous and other pollutants from the chimney gases in a chimney from the boiler, heating water from said boiler being used in a circulating water-heating system comprised of heating radiators and a water return pipe, which comprises

a cooling means in the chimney to heat up a heat-transfer medium and to cool the chimney gases; a condensor-heat exchanger means attached to the water return pipe to cool the heated heat-transfer medium and to heat the water in the water return pipe; a refrigerating compressor means located between said cooling means and said condensor-heat exchanger; and a throttle valve, said cooling means causing water to condense from said chimney gases wherein pollutants in said chimney gases are dissolved therein and said condensate water being removed by

means of a condensate water pipe which contains a deacidification filter to neutralize acid condition resulting from the dissolution of pollutants in the condensate water, and in addition comprises a vapor generator feeding an expander device whereby conversion to mechanical energy takes place and said mechanical energy is employed to drive said refrigerating compressor.

4. A method for cooling chimney gases from a fuel heated boiler and for removing sulphurous and other pollutants from the chimney gases in a chimney from the boiler, heating water from said boiler being used in a circulating water heating system comprised of heating radiators and a water return pipe, which comprises

providing a cooling means in the chimney to heat up a heat-transfer medium to cool the chimney gases, causing the heat-transfer medium to flow to a condensor-heat exchanger means attached to the water return pipe to cool the heated heat-transfer medium and to heat the water in the water return pipe, and causing the heat-transfer medium to flow through a throttle valve back to the cooling means, whereby water condenses from said chimney gases, pollutants in said chimney gases are dissolved therein and the condensate water is removed by means of a condensate water pipe which contains a deacidification filter to neutralize acid condition resulting from dissolution of pollutants in the condensate water, and in addition comprises providing a vapor generator feeding an expander device whereby conversion to mechanical energy takes place and said mechanical energy is employed to drive said refrigerator compressor.

4,227,648

CENTER PIVOT IRRIGATION SYSTEM HAVING APPARATUS FOR IRRIGATING CORNERS

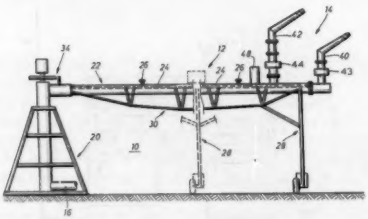
Huland L. Holloway, Melbeta, and Edward M. Norum, Jr., Gering, both of Nebr., assignors to Lockwood Corporation, Gering, Nebr.

Continuation of Ser. No. 778,470, Mar. 17, 1977, Pat. No. 4,161,292. This application Dec. 12, 1978, Ser. No. 968,835

The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.

Int. Cl.[2] **B05B** *3/12*

U.S. Cl. 239—11 **17 Claims**



11. In a center pivot irrigation system having a main pipeline sprinkler rotatable about a center for supplying a generally circular area with irrigating fluid, and having an auxiliary nozzle rotatably carried by the main pipeline sprinkler for irrigating corner regions, the improvement comprising means responsive to irrigating fluid pressure in the main pipeline sprinkler for operating the auxiliary nozzle to discharge irrigating fluid therethrough upon the occurrence of the conditions that

(1) the main pipeline sprinkler is substantially non-rotating;

(2) the main pipeline sprinkler has substantially ceased discharging irrigating fluid; and

(3) pressure in the main pipeline sprinkler has increased to a selected value, indicative that the main pipeline sprinkler has substantially ceased discharging the irrigating fluid.

14. In a center pivot irrigation system having a main pipeline sprinkler rotatable about a center for irrigating a generally circular area with irrigating fluid, and having an auxiliary nozzle rotatably carried by the main pipeline sprinkler for irrigating corner regions, the improved method of operating the system comprising the steps of

(a) substantially stopping rotation of the main pipeline sprinkler;

(b) substantially stopping discharge of the irrigating fluid from the main pipeline sprinkler when its rotation has stopped;

(c) detecting the pressure of the irrigating fluid in the main pipeline sprinkler;

(d) enabling operation of the auxiliary nozzle when the irrigating fluid pressure in the main pipeline sprinkler has increased to a selected value indicating that said step of substantially stopping discharge has been effected; and

(e) irrigating from the auxiliary nozzle upon the completion of steps a–d.

4,227,649

SPRAY MARKING ASSEMBLY

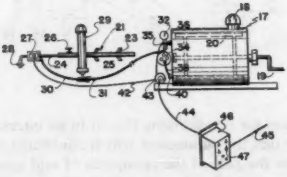
Alfred E. Poffenroth, General Delivery, Delacour, Alberta, Canada (T0M 0T0)

Filed Sep. 7, 1978, Ser. No. 940,395

Claims priority, application Canada, Sep. 28, 1977, 287677

Int. Cl.[3] **B05B** *13/00*

U.S. Cl. 239—124 **6 Claims**



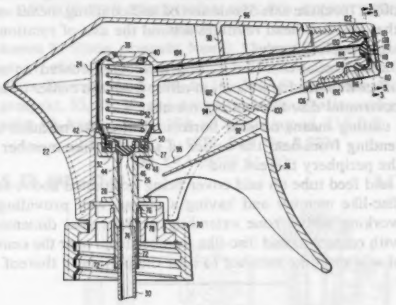
1. A field spray marker for use with an agricultural or horticultural sprayer which includes a source of electrical power, an outwardly extending boom on each side carrying spray nozzles, and a tank containing spray fluid and the like; comprising in combination a tank for carrying marking fluid for spraying visual indicating marks on vegetation and/or ground surfaces, a normally closed solenoid valve situated adjacent the outer end of at least one of said extending booms, a marker discharge nozzle adjacent said solenoid valve and being operatively connected thereto, a pump and motor assembly operatively connected to said tank carrying marking fluid, conduit means operatively connecting said pump and motor to said solenoid valve and means to operate said solenoid valve from the closed to the open position and vice-versa, said pump and motor being constantly operating when said marker is in use thereby maintaining a constant fluid pressure at solenoid valve, an adjustable relief valve operatively connected between said pump and said tank, and means to mount said solenoid valve and said discharge nozzle upon said extending boom, said last mentioned means including a bracket assembly securable to said boom, said solenoid valve and said discharge nozzle being supported upon said bracket assembly, said bracket assembly including an extendable and retractable arm on said bracket, said discharge nozzle and said solenoid valve being supported upon said arm, and means to adjust said arm within limits in an inwardly and outwardly direction relative to said bracket assembly, to position said discharge nozzle relative to said outer end of said boom.

4,227,650

FLUID DISPENSER AND NOZZLE STRUCTURE

James C. McKinney, Atlanta, Ga., assignor to Ethyl Products Company, Richmond, Va.

Continuation of Ser. No. 774,146, Mar. 3, 1977, abandoned, and a continuation-in-part of Ser. No. 729,798, Oct. 5, 1976, Pat. No. 4,161,288. This application Nov. 17, 1978, Ser. No. 961,512
The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.
Int. Cl.[2] B65D *47/34*
U.S. Cl. 239—333 3 Claims



1. An apparatus for dispensing fluids from a container comprising:

(a) a housing;

(b) a pivotable trigger mounted on said housing;

(c) a pump chamber in said housing in communication with the container, the volume of which chamber is varied responsive to the pivoting of said trigger;

(d) an outlet valve on said housing in communication with said pump chamber, said valve being of a unitary construction of a non-metallic, elastic material including a peripheral O-ring portion; a thin, flexible, apertured, annular portion; and a thick, solid, central portion for normally blocking communication with said chamber and responsive to the pressure in said chamber to stretch the thin, annular portion to thereby open the solid, central portion to communicate said chamber with said apertured, annular portion; and

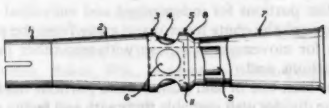
(e) a nozzle cap on said housing making sealing engagement with said O-ring portion and adapted for adjustably contacting the central portion of said outlet valve member to vary the discharge pattern of the fluid dispensed.

4,227,651

NOZZLE FOR USE ON THE EXHAUST OF INTERNAL COMBUSTION ENGINES

Luis A. P. Abe, 141 Maule St., Santiagio, Chile

Filed Jul. 20, 1979, Ser. No. 59,927
Int. Cl.[3] B05B *7/06*
U.S. Cl. 239—428 1 Claim



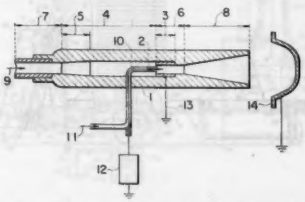
1. A nozzle for use on the exhaust of an internal combustion engine comprising: a first nozzle part having an inlet end, a diverging conical section axially aligned with the inlet end, a converging conical section aligned with the diverging conical section; a second nozzle part axially aligned with said first nozzle part and affixed thereto at the junction between the two conical sections of the first nozzle part, the second nozzle part having a cylindrical air inlet end provided with a plurality of peripheral holes, said air inlet end surrounding and spaced from the converging conical section of the first nozzle part, a converging conical section axially aligned with said cylindrical air inlet, and a diverging conical outlet section axially aligned with said converging conical section; and a cylindrical tube supported axially within the first and second nozzle parts and axially extending from approximately the junction between the two conical sections of the first nozzle part to a location in the second nozzle part between the ends of the diverging conical section thereof.

4,227,652

POWDER CHARGING DEVICE

Tsutomu Itoh, Tokyo, Japan, assignor to Onoda Cement Co., Ltd., Onoda, Japan

Filed May 3, 1979, Ser. No. 35,476
Claims priority, application Japan, May 9, 1978, 53/54701
Int. Cl.[3] B05B *5/02*
U.S. Cl. 239—706 9 Claims



1. A powder charging device characterized in that said device comprises a large-diameter cylindrical flow path, a small-diameter cylindrical flow path having a smaller inner diameter than the inner diameter of said large-diameter cylindrical flow path, an annular electrode disposed at the upstream end of said small-diameter cylindrical flow path, and a needle electrode disposed concentrically with said annular electrode and axially aligned in opposition to each other, said large-diameter cylindrical flow path being disposed contiguously to said small-diameter cylindrical flow path on the upstream side of the latter, and said two electrodes are adapted to have a voltage applied therebetween and wherein said annular electrode has a uniform inner diameter from its mid-point to its downstream end to provide a subsonic flow therethrough in the velocity range of from 7 to 35 meters per second.

4,227,653

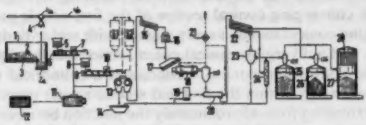
METHOD OF PROCESSING WASTE MATERIALS

Raimund Jetzer, Nussbaumen, Switzerland, assignor to Gewerbebank Baden Aktiengesellschaft, Baden, Switzerland

Continuation of Ser. No. 806,596, Jun. 14, 1977, Pat. No. 4,145,007. This application Jan. 5, 1979, Ser. No. 1,262
Claims priority, application Switzerland, Jun. 14, 1976, 7498/76
The portion of the term of this patent subsequent to Mar. 20, 1996, has been disclaimed.
Int. Cl.[3] B02C *23/14*
U.S. Cl. 241—24 10 Claims

1. A method of processing waste material which contains moisture as well as heavier and lighter solid constituents and wherein said lighter constituents include fibers, comprising the steps of (A) subjecting moist waste material to a first communiting action to thus convert said waste material into heavier particles and lighter particles including lighter fibrous particles of a first size and additional lighter particles of a larger second size; (B) segregating at least the major percentage of heavier

particles from lighter particles; (C) subjecting said additional lighter particles to a cutting action to thus reduce their size to



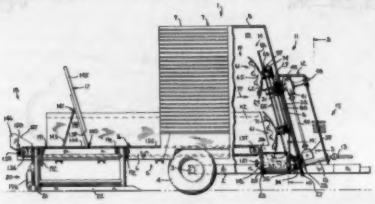
a size not exceeding said first size; and (D) reducing the moisture content of all lighter particles.

4,227,654

BALE PROCESSOR

Dean E. Seefeld, and David K. Schirer, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Oct. 13, 1978, Ser. No. 950,975
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—34 **15 Claims**



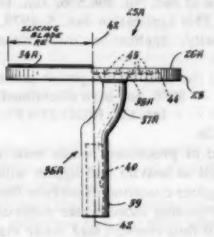
1. An apparatus for disintegrating a bale of fibrous material, comprising a plurality of cutters each including a plurality of blades extending outward from an axis to be directed generally towards a bale, each of said cutters including a plate having a concave outer surface formed about said axis and generally facing said bale and an outer edge with a plurality of mounting projections each connected to one of said blades with said plurality of blades extending radially and axially outward from said plate to be directed toward an oncoming bale, means rotating said plurality of cutters about their said axii, and means connected to said bale and said cutters to provide relative movement between said bale and said cutters along a movement axis to selectively engage said blades against said bale to cut said fibrous material by said blades at a face of said bale.

4,227,655

ROTARY FOOD PROCESSING TOOL HAVING OFFSET HUB

James E. Williams, Stamford, Conn., assignor to Wilson Research & Development Inc., Greenwich, Conn.

Filed May 9, 1979, Ser. No. 37,912
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—92 **18 Claims**



1. In a food processor of the type including a housing containing an electric motor drive, a bowl mountable on said housing for enclosing a rotary food processing tool within said bowl, said tool being adapted to be rotated within said bowl by said electric motor drive, a removable cover adapted to be secured in position on said bowl, and a feed tube mounted on said cover forming a passageway for feeding food items through said cover into said bowl, the invention comprising:

(a) said rotary food processing tool having an elongated hub with a head on end thereof and a coupling means on the other end thereof adapted to be coupled to and rotated by said electric motor drive, said hub head being radially offset from the axis of rotation of said coupling means such that said hub head revolves around the axis of rotation of said coupling means,

(b) a horizontal disc-like cutting member mounted on said offset hub head at a location offset from the center of said horizontal disc-like cutting member,

(c) cutting means on said horizontal disc-like member extending from near the center of said disc-like member to the periphery thereof, and

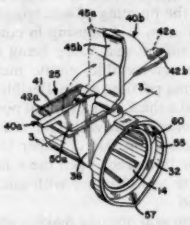
(d) said feed tube on said cover being positioned above said disc-like member and having a passageway providing a working active zone extending in the radial dimension with respect to said disc-like member from near the center of said disc-like member to near the periphery thereof.

4,227,656

VEGETABLE SLICER

Elnar O. Engebretsen, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Dec. 22, 1978, Ser. No. 972,221
Int. Cl.³ B02C *18/00*
U.S. Cl. 241—93 **9 Claims**



1. In a vegetable slicer including a housing having a cavity therein, means for receiving a food processor within the cavity, a port connecting into the cavity for presenting foodstuffs to the food processor, and a chute attached to the port opposite the cavity for containing and guiding foodstuffs through the port to the food processor, the improvement comprising:

(a) a plurality of adjacent pusher plate portions, each pusher plate portion having a face thereon for engaging and pushing foodstuffs to the processor through a corresponding portion of the chute,

(b) mounting means mounting at least one of said pusher plate portions for independent and individual movement through the chute toward and away from the port as well as for movement in unison with said other pusher plate portions, and

(c) at least one of said pusher plate portions having at least one divider wall movable therewith and facing at least one of its adjacent said pusher plate portions to close and separate the corresponding portion of the chute from each said adjacent pusher plate portions when said one pusher plate portion is positioned fully in the chute, said at least one pusher plate portion and its divider wall, when fully in the chute, obstructing access to said closed portion of the chute and consequently reducing the effective capacity of the chute by an amount equal to at least the volume of the

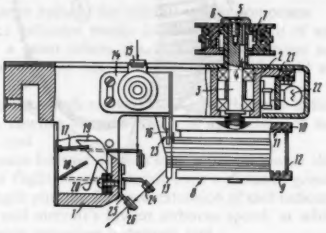
chute swept by its respective pusher plate face, for more expeditious handling of small-sized foodstuffs, and said pusher plate portions and respective divider walls, when together fully removed from the chute, providing unobstructed access to the chute and restoration of the effective capacity of the chute to the full volume of the chute swept by the respective pusher plate faces when moved in unison, for more expeditious handling of large-sized foodstuffs.

4,227,657

DEVICE FOR FEEDING YARN TO A KNITTING MACHINE

Solomon K. Simin, prospekt Nauki, 12, kv. 153; Georgy I. Kurganov, ulitsa Sofii Kovalevskoi, 4, kv. 183; Georgy N. Stark, ulitsa Dzerzhinskogo, 64, kv. 1; Jury S. Kuzovkov, Nevsky prospekt, 53, kv. 20, and Arkady I. Ludar, Svetlanovsky prospekt, 99, korpus 1, kv. 154, all of Leningrad, U.S.S.R.

Filed Feb. 2, 1979, Ser. No. 8,872
Int. Cl.³ B65H *51/20*
U.S. Cl. 242—47.01 **3 Claims**



1. A device for feeding yarn to a knitting machine, comprising:

a shaft rotatably mounted in a housing;

a drive pulley mounted on said shaft for rotating said shaft;

two spaced apart discs mounted on said shaft;

slots in said discs on the sides facing each other and arranged symmetrically in relation to a plane perpendicular to the axis of said shaft;

an elastic band positioned between said discs in the respective opposing slots;

said discs and said elastic band defining a yarn feeding roller, wherein the elastic band serves as a yarn feeding surface with a variable diameter on moving the elastic band along the slots of the discs; and a yarn guide mounted in a stationary position in relation to said yarn feeding roller and spaced therefrom;

said yarn guide being in the form of a rod having its upper portion disposed at an angle to the rotational axis of the yarn feeding roller, and its lower portion disposed parallel to this axis, whereby a change in the speed of feeding yarn and the uniformity of its tension depends on a change in the diameter of the roller.

4,227,658

PAPER WINDER ASSEMBLY INCLUDING PRESSURE MODULATING VALVE

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 11, 1978, Ser. No. 941,315
Int. Cl.³ B65H *17/08*
U.S. Cl. 242—66 **2 Claims**

1. In a paper winder assembly including:

a pair of winder drums, for receiving a roll of paper being wound,

a rider roll positioned to bear against said roll of paper with a variable pressure, and

hydraulically actuated lifting means including a piston and cylinder associated with said rider roll to vary the pressure at which said rider roll bears against said roll of paper, said rider roll applying a maximum pressure to said roll of paper when said pressure in said cylinder is a minimum,

the improvement which comprises:

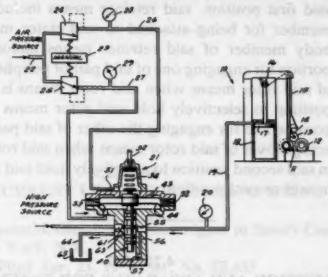
a valve for controlling flow of hydraulic fluid to said lifting means having upper and lower flexible diaphragms therein in axially spaced relation, each of said diaphragms having a constant effective area,

an actuator in said valve movable in response to movement of either of said diaphragms,

means for selectively introducing pressurized air into said valve which acts on said effective areas to deflect one or the other of said diaphragms,

inlet means for introducing pressurized liquid into said valve,

outlet means for directing a flow of pressurized liquid from said valve into said cylinder in said hydraulically actuated lifting means, said actuator being disposed between said inlet and outlet means to control liquid flow therebetween,



bias means producing a selected force normally urging said actuator to a position allowing liquid communication between said inlet and outlet means,

means within said valve operable in response to movement of said actuator for diverting some of the flow through said outlet means and into pressure applying relation with said actuator,

said actuator being movable into a position wherein the flow of pressurized liquid through said outlet means is terminated when the pressure applied by the diverted flow equals said selected force,

whereby liquid flow through said valve increases as pressure acting on said upper diaphragm decreases to raise said rider roll, and liquid flow through said valve decreases as pressure acting on said lower diaphragm increases to lower said rider roll.

4,227,659

FISHING LINE STORAGE REEL

Roy K. Pindell, 3158 Boone, Memphis, Tenn. 38127

Filed Jan. 22, 1979, Ser. No. 5,203
Int. Cl.³ A01K *89/015, 89/02*
U.S. Cl. 242—84.1 R **6 Claims**

1. A storage reel for attachment to a fishing pole to store a quanity of fishing line and to allow the fishing line to be selectively played out and reeled in, said storage reel comprising:

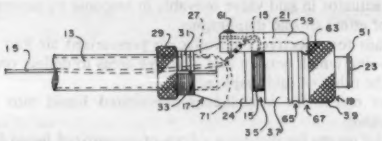
(a) a stator member for being fixedly attached to the butt end of the fishing pole, said stator member including a cylindrical body portion;

(b) a lug member attached to and protruding outwardly from said body portion of said stator member;

(c) rotor means for holding a quanity of fishing line and for being rotatably and slidably mounted on said body portion

of said stator member, said rotor means having a slot therein for selectively receiving said lug member, said rotor means being slidable between a first position with said lub member received within said slot to prevent rotation of said rotor means and a second position with said lug member not received in said slot to allow rotation of said rotor means, said rotor means including a pair of peripheral grooves thereabout; and

(d) retainer means for selectively holding said rotor means in



said first position, said retainer means including a body member for being attached to said stator member, said body member of said retainer means including a heel portion for engaging one of said pair of peripheral grooves of said rotor means when said rotor means is in said first position to selectively hold said rotor means in said first position and for engaging the other of said pair of peripheral grooves of said rotor means when said rotor means is in said second position to selectively hold said rotor means in said second position.

4,227,660

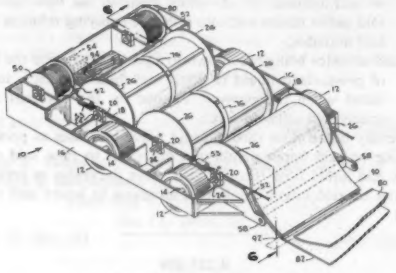
METHOD AND APPARATUS FOR EXTENDING CONVEYOR BELTS

John L. Denny, Beckley, W. Va., and Robert H. Alley, Bluefield, Va., assignors to Advance Mining Products, Inc., Falls Mills, Va.

Division of Ser. No. 934,598, Aug. 17, 1978. This application May 30, 1979, Ser. No. 43,640

Int. Cl.[2] B65H *17/46*

U.S. Cl. 242—86.52 **8 Claims**



1. A carrier vehicle for deploying new conveyor belting material for connection to an old conveyor belt for lengthening the old conveyor belt, said carrier vehicle comprising frame means, supporting wheels supporting said frame means for movement, at least one roll of new belting material rolled in a double thickness about the axis of a drum transverse to the carrier vehicle and having its middle point comprising a loop extending around winding rod means eccentric with respect to the axis of said reel and latch means normally holding said winding rod in position but permitting said winding rod to be removed from within said loop so as to permit said loop to clear said reel upon the unwinding of said roll of new belting material therefrom.

4,227,661

LATCHING MECHANISM AND WINDING APPARATUS INCLUDING SAME

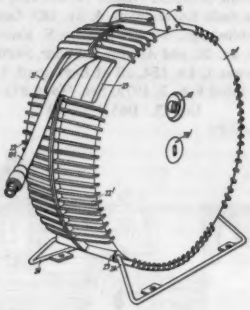
William King, and Edward King, both of 79 Allison Rd., Elsternwick, Victoria, Australia (3122)

Continuation-in-part of Ser. No. 698,308, Jun. 21, 1976, abandoned. This application Jul. 28, 1978, Ser. No. 928,066

Claims priority, application Australia, Jun. 23, 1975, PC2076

Int. Cl.[3] B65H *75/48*

U.S. Cl. 242—107.7 **28 Claims**



1. A latching mechanism comprising:

a stationary support means;

a pawl mounted on said support means for pivotally moving a tooth portion thereof in a generally vertical plane; and

a ratchet wheel rotatably mounted on said support member and lying in said generally vertical plane, said rachet wheel having a least one recess on the periphery thereof and being mounted on said support means adjacent said pawl so that the tooth of the latter is pivotally biased solely by gravity into contact with the periphery of said wheel and into engagement with said recess to restrict rotation of said wheel in one direction, said recess being formed by a pair of peripherally spaced straight flanks terminating at the bottom of said recess, one of said flanks comprising a trailing flank in said one direction of rotation which slants angularly inward against said one direction of rotation at an angle of about 15°±5° with respect to a radius passing equidistantly between said flanks at their bottom terminii to provide a surface capturing said pawl in said recess when said pawl engages said recess, said ratchet wheel having an outwardly extending cam means limited to a predetermined portion of the periphery of said ratchet wheel immediately ahead of said recess in said one direction of rotation, said cam means being contactable by said pawl for providing pivotal movement to said pawl opposite to that obtained by the gravity bias, said cam means being preceded by a peripheral portion of said ratchet wheel having a generally constant radius,

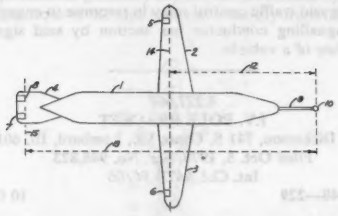
said tooth portion of said pawl being formed to engage said trailing flank of said recess for being captured therein, the amount of the pivotal movement of the pawl upon contacting said cam means being responsive to the angular velocity of said wheel in said one direction and being such that said gravity bias acting on said pawl will be insufficient to cause said pawl to engage said tooth when the velocity of said wheel is in excess of a predetermined latching speed.

4,227,662

AIR TURBULENCE REDUCER

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison, Montreal, Quebec, Canada (H3R 1K3)

Filed May 14, 1979, Ser. No. 38,483
Int. Cl.[2] B64C *13/18*
U.S. Cl. 244—76 C 4 Claims



1. Air turbulence reducer for aircraft which comprises:
air turbulence indicator means located in advance of said aircraft at a point where the ambient air pressure and vertical currents are not materially affected by said aircraft, and
transducer means which converts said air turbulence indication to an electric current which is a function of said indication, and
averaging means for said current over a period longer than the time of flight of said aircraft over a distance greater than its length plus the forward extension of said indicator means, at said aircraft's lowest airborne speed, at which air turbulence reduction is desired, and
recording means which records said current from said transducer and provides two or more readouts of said recorded current each with different delays, said delays being a function of the speed of said aircraft, and
air speed indicator means which is coupled to said recording means, and
two or more comparison means, each of which compares said averaged current with the current of one of said readouts and produces an error current, and
actuator means coupled to each of said comparison means, said actuator means moving said control surface means at a time, in a direction and by an amount which compensates for the effect of turbulent air on said aircraft, said time for movement of each said actuator means being determined by a readout from said recording means, said aircraft air speed and said actuator delay at least one of said control surface means being located near the forward, and at least one near the after end, of said aircraft.

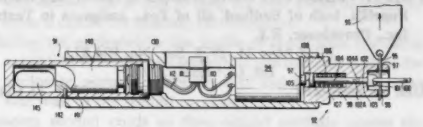
4,227,663

REFURBISHABLE AERIAL CARGO DELIVERY SYSTEM AND SOLID STATE CIRCUIT THEREFOR

Vernon B. Ramsey, Lewisburg, and Donald E. Woods, Shelbyville, both of Tenn., assignors to Teledyne Inc., Los Angeles, Calif.

Filed Feb. 6, 1978, Ser. No. 875,483
Int. Cl.[3] B64D *17/56*
U.S. Cl. 244—149 12 Claims

1. An altitude sensor parachute staging unit comprising,
a first housing assembly containing an electronic barometer pressure transducer and altitude selection means for producing a parachute deployment signal,
a second housing assembly containing a direct current electrical power supply and an electrically activated cable cutter for cutting a parachute deployment cable,
complementary electrical connector means on said first and said second housing assemblies for coupling electrical energy from said power supply to said electronic barometer pressure transducer and altitude selection means contained in said first housing and for coupling said parachute deployment signal from said first housing assembly to said



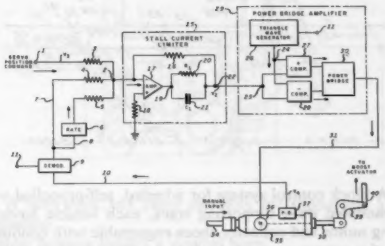
second housing assembly to activate said electrically activated cable cutter at a selected altitude during descent of said altitude sensor parachute staging unit.

4,227,664

STALL CURRENT LIMITER FOR SERVO DRIVE SYSTEMS

Edmund R. Skutecki, Glendale, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,433
Int. Cl.[3] G05D *1/00*
U.S. Cl. 244—194 7 Claims

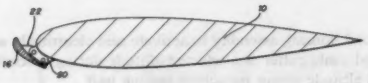


1. Craft control surface positioning means including actuator means responsive to manual and electrical control inputs for establishing the position of said control surface, and further comprising:
pick off means for generating a first electrical measure of said position,
combining network means for combining said first electrical measure and a second electrical measure representative of a servo position command for forming the output of said combining network means,
stall current limiter means coupled to said combining network output,
said stall current limiter means including: amplifier means, resistance-capacitance network means in series with said amplifier means, and
feedback resistor means coupled from said resistance-capacitance network means output to said output of said combining network means, and
power amplifier means responsive to said stall current limiter means for providing said electrical input to said actuator means.

4,227,665
FIXED LEADING EDGE SLAT SPOILER FOR A HORIZONTAL STABILIZER

Floyd W. Carlson, Fort Worth; Michael L. Hester, and David A. Popelka, both of Bedford, all of Tex., assignors to Textron, Inc., Providence, R.I.

Filed May 11, 1978, Ser. No. 904,813
Int. Cl.³ B64C *21/02*
U.S. Cl. 244—210 **11 Claims**



1. In a helicopter having a horizontal stabilizer, the combination therewith comprising:

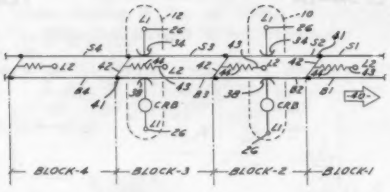
(a) a leading edge slat/spoiler parallel to said stabilizer, and

(b) a plurality of brackets supporting said slat/spoiler in position such that the slat/spoiler extends down and aft at a predetermined spacing ahead and below the leading edge of said stabilizer for early stall in descending flight as well as increasing the angle for stall in climbing flight.

4,227,666
BLOCK CONTROL SYSTEM FOR SELF-PROPELLED VEHICLES

George D. MacMunn, Southfield, and Ward T. Brennan, Royal Oak, both of Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed May 18, 1978, Ser. No. 906,988
Int. Cl.³ B61L *21/06, 21/10*
U.S. Cl. 246—187 C **15 Claims**

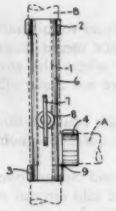


1. A block control system for wheeled, self-propelled vehicles mounted on a supporting track, each vehicle having a driving motor and collector shoes engageable with conductor rails of a power source extending parallel to the supporting track for energizing a power circuit for the driving motor; a signalling conductor bar and a blocking conductor bar each extending parallel to said conductor rails, and insulation means dividing each conductor bar into a plurality of sections with one section of signalling conductor bar being located in a first traffic control block and one section of blocking conductor bar being located in a second traffic control block; means for electrically connecting said signalling conductor bar section to said blocking conductor bar section; a signalling contact shoe and a blocking contact shoe on each vehicle, said contact shoe being respectively engageable with said signalling and blocking conductor bars, said contact shoes being electrically connected to at least one side of said power circuit; a block control relay on each vehicle, said relay having a contact in series relation with said power circuit for the vehicle driving motor; block control relay circuit means for regulating the operational state of said relay whereby the driving motor of a vehicle in said second traffic control block is de-energized in response to a block signal applied to said blocking conductor bar section, said circuit means including a connection from the blocking contact shoe of each vehicle to the block control relay of that vehicle, an enabling connection from one side of the power source to said blocking conductor bar section, vehicle carried means connecting the other side of the power source through the block control relay to said blocking contact shoe for energizing the block control relay; and shunt circuit means for connecting said other side of the power source to said blocking conductor bar section whereby the block control relay is de-energized in response to a block signal applied by said shunt circuit means; wherein the improvement comprises a traffic control relay, switch means operable by said traffic control relay for closing said shunt circuit means, and circuit means for energizing said traffic control relay in response to engagement of said signalling conductor bar section by said signalling contact shoe of a vehicle.

4,227,667
I.V. POLE BRACKET

Henry R. Dickerson, 741 S. Chase La., Lombard, Ill. 60148

Filed Oct. 5, 1978, Ser. No. 948,823
Int. Cl.³ A47B *96/06*
U.S. Cl. 248—229 **10 Claims**



1. In a device for mounting an intravenous dispensing reservoir onto the frame structure of and for movement with a patient supporting device, such as a chair or table, said intravenous device having a reservoir and a rod for supporting said reservoir, the combination comprising:

a tubular support means for receiving the rod of said intravenous equipment for support thereof; and

clip means comprising a pair of gripping members having a common axis and means fixing said gripping members to said tubular support in spaced relation to each other and with said tubular support means extending substantially parallel to said common axis, said gripping members being of such size and shape as to be readily snappable onto a suitable portion of said frame structure, and a third gripping member mounted fixedly with respect to said pair of gripping members and tubular support means and oriented with its axis at an angle to, and intersecting, said common axis between said pair of gripping members, whereby to permit securement of said device simultaneously to two intersecting members of said frame structure and said reservoir supporting rod.

4,227,668
HANGER MEMBER

Donald J. Ernst, Milwaukee, Wis., assignor to Rheem Manufacturing Company, Apex, N.C.

Continuation of Ser. No. 739,939, Nov. 8, 1976, abandoned. This application Aug. 15, 1978, Ser. No. 933,859
Int. Cl.² B42F *13/00*
U.S. Cl. 248—317 **6 Claims**

1. A plurality of substantially identical hanger members, each member adapted to be attached by clip means to a product filled casing or the like to permit hanging of the product, each of said members comprising, in combination:

a length of generally flat, flexible tape material, said material including parallel sides, opposite ends, a flat surface, and a slit in the flat surface through the material, said slit extending from adjacent one end of the length of tape material toward the opposite end, said slit terminating with oppo-

site slit ends, each end connected with a circular cutout in the tape material to prevent propagation of the slit in the tape material, said slit defining means for forming a loop upon separating the sides of the slit by flexing of the tape material on opposite sides of the slit in opposite directions to permit a hanger member support to be projected through the formed loop;

a plurality of spaced ridges formed at the opposite end of the tape material generally beyond the slit formed by removal of portions of the tape material inwardly from the parallel

sides to define ridges extending, said ridges being in opposed relation on opposite sides of the tape material and extending generally transverse to the direction of the slit whereby a clip can be fitted about the tape material adjacent the ridges, said ridges being cooperative with the clip to retain the hanger member attached to a casing; and

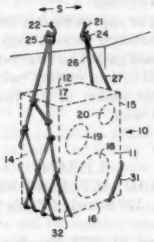
each of said members being formed integrally in a single elongate tape with the slit end of each member adjacent the ridge formed end of the next adjacent member, each member being of substantially uniform length.

4,227,669

HANGER AND METHOD FOR SOUND SPEAKERS

Donald E. McInnis, 444 Saratoga Ave. 15-H, Santa Clara, Calif. 95050

Filed Apr. 9, 1979, Ser. No. 27,987
Int. Cl.[2] F16M *13/02*
U.S. Cl. 248—317 **7 Claims**



1. A method of supporting a sound speaker enclosure from a ceiling of a room, said enclosure having top, two side, back, front and bottom walls, said method comprising the steps of:

placing first and second supports in the ceiling above the location at which it is desired to have the speaker enclosure suspended, said supports being positioned apart less than the width of the enclosure;

fixing to the supports the opposite ends of a plurality of first soft flexible cords and joining the first cords together to form a cradle for holding the enclosure;

placing the enclosure in the cradle of cords with the cords extending from the first support down one side wall of the enclosure, across the bottom wall and back up the other side wall to the second support;

placing second cords so they extend partially across the front and back walls of the speaker; and

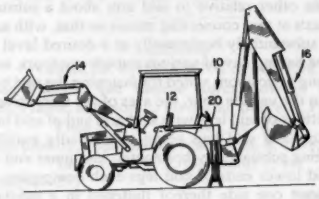
tying a cross cord between the downwardly extending cords at the position where they extend from the first and second supports adjacent the enclosure back wall and tightening said cross cord sufficiently to tilt the speaker enclosure at the proper angle to effectively project sound across the room.

4,227,670

PIVOTABLE SEAT SUPPORT

Lloyd A. Vander Burgh, Naperville; R. Dale Moore, Wheaton, and Joseph Paplaski, Chicago, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed May 25, 1978, Ser. No. 909,425
Int. Cl.[3] F16M *13/00*; A47C *1/02*
U.S. Cl. 248—416 **7 Claims**



1. A seat track and pivot assembly for supporting a seat comprising:

a stem housing having a vertical bore;

a stem carried axially and restrained laterally in said stem housing;

a seat support base including, a base plate welded to said stem, left and right roller supports welded to said base plate, and a latch arm support welded to said base plate;

a plurality of rollers attached to said left and right roller supports of said seat support base;

a horizontal rail frame including, a left side track and a right side track and a horizontal latching trap between said left side track and said right side track, said horizontal rail frame supported for horizontal movement on said plurality of rollers;

a swivel latching trap axially located on said stem housing;

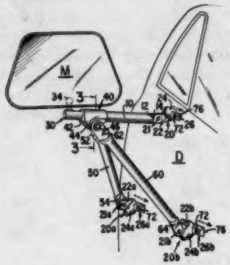
a latch arm pivotally supported on said latch arm support of said seat support base, said latch arm having a first tab attached to one end thereof and a second tab attached to the other end of said latch arm; and

a latch spring restrained between said base plate of said seat support base and said latch arm urging said latch arm to a horizontal position whereby said first tab and said second tab of said latch arm engage respective horizontal latching trap and said swivel latching trap.

4,227,671
VEHICLE REAR VIEW MIRROR MOUNTING

Joseph R. Bourassa, Huntington, and Manuel Lopez, Trumbull, both of Conn., assignors to Parker-Hannifin Corporation, Shelton, Conn.

Division of Ser. No. 516,759, Oct. 21, 1974, Pat. No. 4,120,476.
This application Jul. 13, 1978, Ser. No. 924,341
Int. Cl.[2] B60R *1/06*
U.S. Cl. 248—480 5 Claims



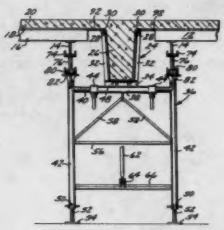
1. A vehicle door rear view mirror mounting comprising an arm adapted to protrude substantially horizontally from a vehicle door, a mirror support held by an outer end portion of said arm, two legs diverging each from the other in downward direction, means connecting the respective upper ends of said legs pivotally with and in a fixed location on the outer end of said arm, and footing brackets connected pivotably, respectively, with the inner end of said arm and the lower ends of said legs and adapted to be fastened at three spaced apart locations on the vehicle door, said legs each being pivotable independently of the other relative to said arm about a substantially horizontal axis at said connecting means so that, with said arm protruding substantially horizontally at a desired level from a vehicle door having any of various outside contours, said legs may be swung to positions suited for fastening the said brackets thereon onto the vehicle door, the axes of the respective pivotable connections of said legs with said arm and of said brackets with said arm and said legs being substantially parallel and normally being substantially horizontal, said inner end of said arm and said lower ends of said legs each comprising an ear having at least one side thereof flattened in a substantially vertical plane, each of said footing brackets comprising a rigid angled strap having a substantially flat upstanding portion fixed pivotably to a said flattened ear side and having a substantially flat foot portion protruding substantially horizontally and laterally to one side of the respective arm or leg for fastening the latter to said door, whereby a mirror on said support may be mounted readily in a desired viewing position on a vehicle door having any of various outside contours.

4,227,672
BEAM FORM AND SHORING STRUCTURE

Arthur L. Cunningham, 6055 Windemere Way, Riverside, Calif. 92506

Filed Mar. 26, 1979, Ser. No. 24,014
Int. Cl.[3] E04G *11/40*
U.S. Cl. 249—28 10 Claims

1. Beam form and shoring structure comprising:
an elongated beam form having a beam form axis and adapted for use in forming a beam having a corresponding beam axis extending at a predetermined height between the centerlines of adjacent vertical columns of a building structure;
a plurality of shoring frames spaced apart along the length of said beam form and each including an upper portion pivotally carried by said beam form as an integral part thereof for movement of the associated said shoring frame between a vertical supporting position and a generally horizontal moving position, each shoring frame including, relative to said supporting position, a pair of vertically disposed, laterally spaced apart side portions having vertically adjustable jacks at their lower extremities, respectively, said jacks being operative to adjust the vertical

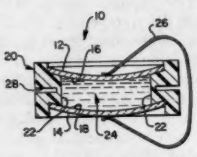


position of said upper portion of said shoring frame to locate said beam form axis at said predetermined height, each said shoring frame further including adjusting means operative upon said upper portion for laterally moving said beam form to locate said beam form axis in alignment with said beam axis.

4,227,673
GASKET FOR CASTING LENSES

Bertram R. Goodwin, Feeding Hills, and Bradford Canterbury, Sturbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 10, 1979, Ser. No. 65,661
Int. Cl.[2] B29C *1/00*; B29D *11/00*
U.S. Cl. 249—117 7 Claims



1. A lense casting cell comprising the combination of:
an annular resilient gasket having a radially inwardly directed generally T-shaped cross-sectional configuration, the inner most side of which provides a wall of a casting cavity within said cell;
a pair of mold halves, one positioned against each of opposite sides of said gasket in adjoining relationship with said wall of said cavity, and.
said gasket having an approximately intermediately disposed external slot extending about a major position of the circumference of said gasket and extending radially inwardly toward said wall of said casting cavity for enhancing the flexibility of said gasket in the functional area thereof adjacent to said wall.

4,227,674
LIQUID METERING VALVE

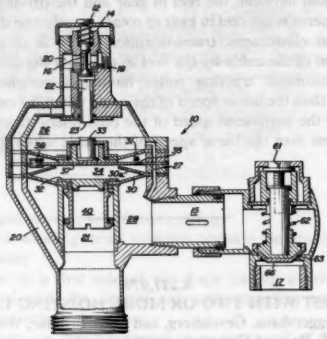
Walter H. Grant, Jr., 320 Board of Trade Pl., New Orleans, La. 70130

Filed Jun. 30, 1977, Ser. No. 811,682
Int. Cl.[3] F16K *21/06*, *31/128*
U.S. Cl. 251—15 17 Claims

11. A liquid metering flush valve for controlling and supplying liquid to a plumbing fixture comprising: a housing for connection between an inlet source of supply liquid and an outlet plumbing fixture; a poppet within said housing and

associated therewith to selectively permit said supply liquid to flow through said housing; means for actuating said poppet; and control means including two movable sealed chambers containing a captive fluid completely separate from the supply liquid,

valve operator means and valve actuating means responsive to operator means actuation for effecting operation of said control means to control the flow of the supply liquid from the third chamber to the outlet whereby fluid in the fourth chamber pushes the two movable chambers toward



the third chamber, means for mounting the valve operator means remote from the control means, first and second lengths of tubing and means to connect the first and second lengths respectively to the third chamber and to the outlet, and means on the two movable valve chambers for preventing flow from the third chamber to the outlet upon movement of the two sealed chambers in a maximum direction toward the third chamber, the last mentioned means including non-hold open means for continuing to prevent flow from the third chamber as the two sealed chambers move toward the fourth chamber.

4,227,675

BUTTERFLY VALVE STRUCTURE AND A SLEEVE THEREFOR

Jean G. Sutter, Villers-les-Nancy, and Alain A. P. Pereebois, Pont-a-Mousson, both of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Jan. 27, 1978, Ser. No. 873,047

Claims priority, application France, Feb. 7, 1977, 77 03370

Int. Cl.³ F16K *1/226*

U.S. Cl. 251—173 **14 Claims**

1. A butterfly valve structure comprising means defining a valve body having a longitudinal axis and defining a rigid inner wall having an annular groove, a recess in each opposite end of the body, means defining a butterfly valve member having a median plane, means mounting the valve member in the valve body to pivot about an axis extending transversely of said longitudinal axis, an elastically yieldable sealing sleeve mounted within the valve body, the sleeve being entirely of a flexible elastomer and in one piece and having a U-shaped radial cross-section, the U-shaped defining a web and two branches extending radially outwardly from the web, said branches pertaining to two thin annular end flanges of the sleeve which respectively comprise a sealing bead at an end of the flanges remote from the web, the flanges being respectively located in the recesses and the sealing beads projecting axially beyond the opposite ends of the body, the web being cylindrical and comprising an annular thick portion, the thick portion being located in the vicinity of the median plane of the valve member in a valve-closing position of the valve member substantially between two radial planes which are substantially parallel to and disposed on opposite sides of and at substantially equal distances from said median plane, the thick portion being connected to the flanges by annular thin portions of the web and projecting radially inwardly and outwardly from said annular thin portions, the thick portion defining a seat extending between said two radial planes for the valve member and further defining an annular outer projection which extends substantially between said two radial planes and is disposed in

the groove of the valve body, the projection having, in the free state thereof, the same cross-sectional shape and size as the groove and consequently being in an uncompressed state in said groove when the valve member is in a position for fully opening the valve, and the depth of the groove being equal to at least 4/10 of the minimum radial thickness of the thick portion in one of said two radial planes.

4,227,676

VEHICLE UNLOADING MACHINE

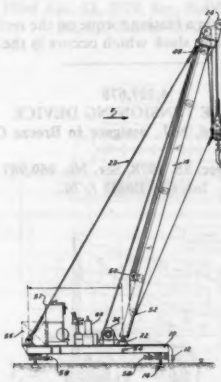
Christian Vaillant, and Eugéne Korcz, both of Douchy les Mines, France, assignors to Fives-Cail Babcock, Paris, France

Filed Feb. 1, 1979, Ser. No. 8,744

Claims priority, application France, Feb. 6, 1978, 78 03173

Int. Cl.³ B66C *23/60*; B66D *1/44*

U.S. Cl. 254—277 **7 Claims**



1. A vehicle unloader comprising a sloping jib having an end, a lifting mechanism consisting of a motor, a pulley mounted at the end of the jib, at least one first cable passing over the pulley, a hook to which the first cable is attached, and a hook positioning system consisting of a second cable attached to the hook and to the jib, a cylinder for varying the tension of

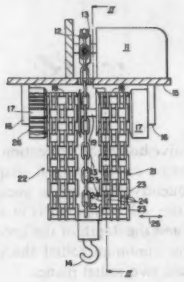
said second cable, a three-position selector having a first position causing the cylinder to move so that the hook is brought towards the jib, a second position causing the cylinder to move so that the hook is allowed to move in the opposite direction away from the jib and a third position causing the cylinder to be isolated; a power source; and a control unit the operation of which is dependent on the amount of power absorbed by the motor of the lifting mechanism and which connects the cylinder to the power source and ensures that it is supplied with reduced power from said source when the hook is loaded and the motor of the lifting mechanism is energized.

4,227,677

ANTI-SWAY DEVICE FOR HOISTS AND CRANES

Henry J. Bernaerts, R.F.D. 10, 1610 Laurel La., Annapolis, Md. 21401

Filed Mar. 26, 1979, Ser. No. 23,554
Int. Cl.³ B66D *1/00*
U.S. Cl. 254—264 **9 Claims**



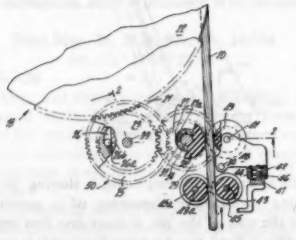
1. An anti-sway device for stabilizing the free end of a lifting line suspended from a lifting apparatus comprising:
- at least one retractable roller chain suspended parallel and adjacent to the lifting line, the suspended end of said chain being attached to the line near its free end, whereby the chain provides to the free end of the line a stiffness and resistance to lateral movement in a direction parallel to the pivotal axes of the chain's rollers;
- a takeup reel for storing the unsuspended portions of the roller chain; and
- a means for exerting a biasing torque on the reel to cause the reel to takeup any slack which occurs in the roller chain.

4,227,678

CABLE TENSIONING DEVICE

Elmer Laky, Cranford, N.J., assignor to Breeze Corporations, Inc., Union, N.J.

Filed Dec. 15, 1978, Ser. No. 969,987
Int. Cl.³ B66D *1/76*
U.S. Cl. 254—391 **6 Claims**



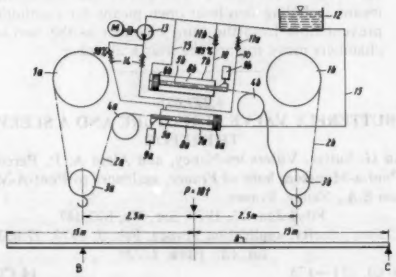
1. A cable tensioning device comprising a rotatable drum, a cable secured at one end to said drum, a driving ring gear secured to the drum and rotatable therewith, a gear train operatively coupled to the driving ring gear, said gear train comprising an input gear, an output gear, a first overrunning clutch means for cable reel out coupled between the input gear and the output gear and which permits the output gear to rotate when the input gear rotates in one direction, a reel in gear in mesh with the input gear, a driving gear in mesh with the output gear, a second overrunning clutch means for cable reel in coupled between the reel in gear and the driving gear and which permits the reel in gear to rotate in only one direction to drive an elastomeric traction roller which is driven in the direction of the cable by the reel in gear and the driving gear, the elastomeric traction roller having a peripheral speed greater than the linear speed of the cable when the cable is paid out and the peripheral speed of the elastomeric traction roller being less than the linear speed of the cable when the cable is paid in.

4,227,679

HOIST WITH TWO OR MORE HOISTING UNITS

Fred Wiggershaus, Gevelsberg, and Felix Schäfer, Wetter, both of Fed. Rep. of Germany, assignors to Mannesmann Demag A.G. Wolfgang-Reuter-Platz, Duisburg, Fed. Rep. of Germany

Filed Mar. 19, 1979, Ser. No. 21,909
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812687
Int. Cl.³ B66D *1/26*
U.S. Cl. 254—270 **7 Claims**



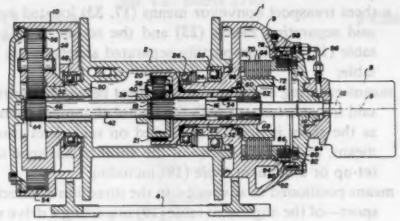
1. A multi-unit hoist apparatus comprising
(a) a hoist body;
(b) a plurality of hoist units disposed on said body;
(c) a cable extending from each hoist unit to a point on said body;
(d) a load support suspended from each cable of each unit; the improvement characterized by
(e) a reversible pressure medium unit disposed in each cable adjacent said hoist body;
(f) the end of each said cable opposite its respective hoist unit connected to the piston rod of its respective pressure medium unit;
(g) a supply of pressure medium;
(h) flow communication means between said supply and each said reversible pressure medium unit; and
(i) an overload check valve in said flow communication means for each said pressure medium unit;
(j) each said overload check valve preset to allow pressure medium flow between each individual unit to said source, if overloaded.

4,227,680

HYDRAULIC WINCH

Stan Hrescak, Burnaby, Canada, assignor to B. C. Gearworks Ltd., Delta, Canada

Filed Feb. 28, 1979, Ser. No. 16,197
Int. Cl.[3] B66D *1/22, 1/24*
U.S. Cl. 254—344 11 Claims



1. A rapid reverse winch comprising:

a hollow winding drum rotatable about a longitudinal central axis;

a motor to a first side of the drum having a drive shaft coaxial with the central axis and extending towards a second side of the drum;

a primary sun gear connected to an inner end of the drive shaft;

a primary internal gear extending about the primary sun gear;

a primary planet hub between the primary sun gear and the primary internal gear;

a plurality of planet gears rotatably mounted on the primary planet hub in mesh with the primary sun gear and the primary internal gear;

a final drive sun gear to a second side of the drum and connected to the primary planet hub;

a non-rotatable drive housing with a final internal gear extending about the final sun gear;

a final drive planet hub between the final drive sun gear and the final drive housing and connected to the drum;

a plurality of planet gears rotatably mounted on the final drive planet hub in mesh with the final internal gear and the final sun gear; and

free-wheel means between the drive shaft and the primary internal gear permitting rotation between the drive shaft and the primary internal gear when the motor rotates the drum in a winding-in direction and non-rotatably interconnecting the primary internal gear and the drive shaft when the drum is rotated in a reeling-out direction opposite to the winding-in direction.

4,227,681

SILVER RECOVERY CARTRIDGE FOR USED FIXER OF NEUTRAL OR HIGHER PH

Michael Golben, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 25, 1979, Ser. No. 51,367
Int. Cl.[3] C22B *11/04*
U.S. Cl. 266—170 1 Claim

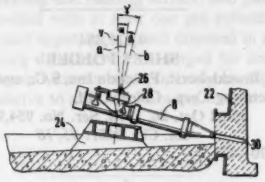
1. A cartridge for the substantial prevention of the premature obstruction to the flow of the incoming spent solution in a silver recovery device having a metallic filler comprising a porous pad adapted to be positioned against a substantial portion of the surface of said metallic filler nearest the incoming silver containing solution, whereby said pad provides a three-dimensional support network for the growth of the silver dendrites such that flow pathways for incoming solutions are maintained.

4,227,682

GUIDE AND SUPPORT STRUCTURE FOR FURNACE TAPHOLE PLUGGING OR DRILLING DEVICE

Léon Ulveling; Pierre Mailliet, both of Howald, and Jean Metz, Luxembourg, all of Luxembourg, assignors to Paul Wurth, Luxembourg, Luxembourg

Filed Sep. 18, 1978, Ser. No. 943,224
Claims priority, application Luxembourg, Dec. 22, 1977, 78756
Int. Cl.[3] C21C *5/48*
U.S. Cl. 266—271 12 Claims



1. In apparatus for positioning and supporting a drill relative to a taphole of a shaft furnace, the furnace having a generally vertically oriented axis, the positioning and supporting apparatus having support arm means for pivoting about a first axis inclined with respect to the furnace axis, the drill having a longitudinal axis and being pivotally mounted from the support arm means so that the drill axis is rotatable about a second axis which is not parallel to said first axis, the improvement comprising:

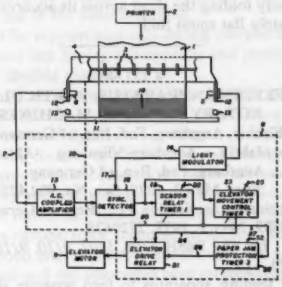
pivot means for connecting the drill to the support arm means, said pivot means defining said second axis, said second axis being inclined with respect to said first axis when the drill is in its operative position, said first and second axes lying in planes which intersect at an oblique angle.

4,227,683

STACK HEIGHT SENSOR AND ELEVATOR CONTROL FOR A CONTINUOUS FORMS REFOLDER

Charles W. Spangler, and Eugene S. Haymes, both of Waynesboro, Va., assignors to General Electric Company, Waynesboro, Va.

Filed Apr. 12, 1979, Ser. No. 29,389
Int. Cl.[3] B65H *45/00*
U.S. Cl. 270—61 F 7 Claims



1. A stack height sensor and elevator control for a continuous fan-fold paper refolder wherein an elevator receives the unfolded paper coming from a source and drives it longitudinally toward a platform on which the paper is to be stacked, a motor for driving the elevator to maintain a range of desired spacing between the height of the stack of paper refolded on the platform and the elevator, a first timer responsive to the

buildup of the stack height to a predetermined minimum distance with respect to the elevator for starting the motor after a first predetermined first time interval to start raising the elevator toward a predetermined maximum distance with respect to said stack height, a second timer responsive to said stacked height attaining a predetermined intermediate distance with respect to said elevator which is a function of said first time interval to stop the motor after a predetermined second time interval, a third timer responsive to said stacked height not attaining said intermediate level after a predetermined third time interval for stopping said motor.

4,227,684

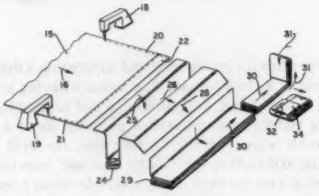
SHEET FOLDER

Charles E. Brocklehurst, Fountain Inn, S.C., assignor to Opelika Manufacturing Corp., Chicago, Ill.

Filed Oct. 26, 1978, Ser. No. 954,935

Int. Cl.³ B65H *45/18*

U.S. Cl. 270—67 **14 Claims**



1. A method of folding rectangular bed sheets and the like comprising moving a sheet in a substantially unfolded configuration along its length along a horizontal path, grasping the sheet at the sides of its leading edge, pulling the sheet at its leading edge across its length to stretch the leading edge of the sheet, moving the stretched leading edge of the sheet into a nip roll means for grasping the leading edge portion of the sheet, and feeding the leading edge of the sheet with the nip roll means down an incline toward a first clamp means, and when the leading edge of the sheet arrives at the first clamp means, releasing the sheet with the nip roll means and holding the leading edge of the sheet in the first clamp means, spreading the sheet away from the first clamp means into a second clamp means, holding the sheet in the second clamp menas and releasing the sheet with the first clamp means, spreading the sheet away from the second clamp means into the first clamp means, repeating the steps of holding, spreading and releasing until the sheet is formed in a flat elongated accordion fold, moving the accordion folded sheet laterally along its folded length and progressively folding the sheet across its accordion folds in an approximately flat spiral fold.

4,227,685

SHEET FEEDING APPARATUS, PARTICULARLY FOR ROTARY PRINTING MACHINES

Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft (M.A.N.), Augsburg, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,422

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720599; May 7, 1977, 2720675

Int. Cl.³ B65H *3/08, 5/02, 9/10, 9/16*

U.S. Cl. 271—13 **7 Claims**

7. Sheet feeding apparatus to feed separate sheets from a stack **(27)** to a machine **(3)** particularly for combination with a sheet-fed rotary offset printing machine

comprising the combination of cooperating means;

sheet separating means **(23)** separating a single sheet from the stack **(27)**;

a set-up or alignment table **(19)** adjacent the machine **(3)**;

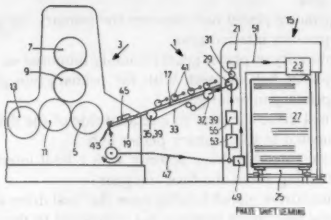
front edge alignment means **(43)** movably positioned on a forward location of the set-up or alignment table to provide for frontal alignment of the sheet positioned on said set-up table when the alignment means are in a sheet alignment position, and release of the sheet when the alignment means are moved to a release position;

lateral edge alignment means **(45)** positioned at the side or lateral location of the set-up or alignment table **(19)** to provide for lateral alignment and guidance of a sheet positioned on said table;

a sheet transport conveyor means **(17, 33)** located between said separating means **(23)** and the set-up or alignment table **(19)** and transporting separated sheets to the set-up table;

means ensuring engagement of a sheet being transported on said transport means with the lateral alignment means **(45)** as the sheet is being transported on said sheet transport means, and prealignment of the sheet in advance of said set-up or alignment table **(19)** including

means positioned in advance—in the direction of sheet transport—of the alignment table **(19)** imparting a drive movement on the sheet while the sheet is on said sheet transport conveyor means and having a vectorial direction transverse to the direction of movement of the sheet from the separating means to the front alignment means of the set-up or alignment table **(19)** by superimposing a drive



force transverse to said direction of movement on the force exerted on the sheet by the sheet transport conveyor means to obtain a resulting force acting on the sheet which has a lateral component directed towards said lateral alignment means **(45)**;

drive means **(47, 53, 55; 29, 39)** including a variable speed transmission in driving connection with said sheet transport conveyor means, and coupled to the sheet separating means **(23)**, to the movable front alignment means **(43)** and to the machine **(3)** to synchronize operation of the separating means, the sheet transport conveyor means and the movement of the front alignment means with the machine receiving the separated sheet;

a lateral sheet moving mechanism **(57)** located on said set-up or alignment table **(19)** and operable to move a sheet positioned in engagement with said front alignment means **(43)** and laterally into engagement with said lateral alignment means **(45)**;

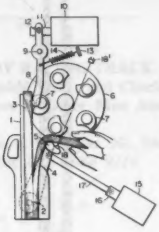
and selectively operable lock-out means **(82)** engageable with said lateral sheet moving mechanism **(57)** to selectively disable said lateral sheet moving mechanism and permit placement of a sheet being fed by said sheet transport conveyor means into engagement with said lateral alignment means **(45)** by said transverse drive movement imparting means.

4,227,686

APPARATUS FOR EXTRACTION OF DESIRED NUMBER OF SHEETS FOR USE IN A SHEET COUNTING MACHINE

Shinya Uchida, and Junichi Arikawa, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1979, Ser. No. 52,751
Claims priority, application Japan, Jun. 30, 1978, 53-80292
Int. Cl.³ B65H *3/42*
U.S. Cl. 271—95 2 Claims



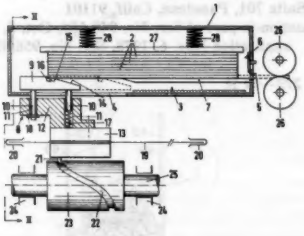
1. In a counting machine for paper sheets and the like wherein paper sheets held in a stack between a holder and a paper-pressing bar are sucked and counted one at a time by respective suction heads provided on a rotational cylinder, a desired number of counted paper sheets on the side of the presssing bar being extracted from the machine by a separator which separates the counted sheets from the remaining sheets in a stack when the desired number of sheets have been counted; an apparatus for extracting a desired number of sheets comprising an operational mechanism incorporating a solenoid and associated members which is operated in cooperation with the action of said separator which separates the desired number of counted paper sheets from the remaining paper sheets so as to move said paper-pressing bar in a direction away from said holder and which can be reset to its original state, whereby the desired number of paper sheets can be extracted under a condition where they are distant from the remaining paper sheets.

4,227,687

APPARATUS FOR SEPARATING AND REMOVING A SHEET FROM A STACK OF SUCH SHEETS

Bertus Schoonmade, Delft, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Apr. 13, 1978, Ser. No. 896,008
Claims priority, application Netherlands, Apr. 20, 1977, 7704308
Int. Cl.³ B65H *3/36*
U.S. Cl. 271—139 1 Claim



1. An apparatus for separating and removing a sheet from a stack of sheets which comprises:

support means for supporting said stack of sheets about longitudinal edges thereof; and

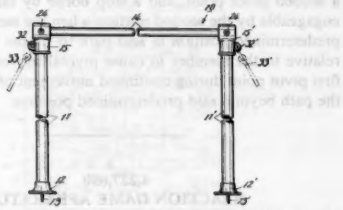
pushing means for engaging the lowermost sheet in said stack reciprocating in a direction of transport between a point at which the lowermost sheet contacts a pushing surface of said pushing means at the rear of said stack for the transport of said lowermost sheet to a point of further transport of said sheet, said pushing means being comprised of a block-shaped member having an upper surface inclined downwardly to the direction of transport and having a groove formed in said upper surface transverse to said direction of transports, said groove having a difference in height between a front and rear edge thereof thereby forming said pushing surface, said pushing means being provided with at least one pin extending at right angles to said upper surface and disposed in a guide in a reciprocating drive member arranged for controlled reciprocating movement, said pin being spring-biased upwardly relative to said reciprocating drive member.

4,227,688

EXERCISE ASSEMBLY WITH FLEXIBLE BAR MOUNTING

Hisao Senoh, and Fushi Senoh, both of 2 - 31 - 13, Shinmachi, Setagaya-Ku, Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,206
Int. Cl.³ A63B *1/00*
U.S. Cl. 272—62 8 Claims



4. An exercise assembly for supporting a user comprising a pair of spaced and parallel upright posts adapted to be supported at the lower ends thereof on a support surface,

flexible joints each having a lower portion received on the upper end of the associated post,

a grip rod for supporting a user during exercise and spanning said posts and having the opposite end portions received in said flexible joints,

first pivotal interconnection means between an end of said grip rod and the associated post establishing limited pivotal movement therebetween about a vertical axis when a horizontal force is applied to the rod during exercise,

second pivotal interconnection means between an end of said grip rod and the associated post establishing limited pivotal movement therebetween about a horizontal axis when a vertical force is applied to the rod during exercise,

third pivotal interconnection means between an end of said grip rod and the associated post establishing limited pivotal movement therebetween about an axis at a substantially 45° angle on one side of the vertical when a slanting force is applied to the rod during exercise, and

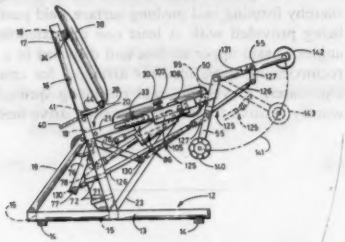
fourth pivotal interconnection means between an end of said grip rod and the associated post establishing limited pivotal movement therebetween about an axis at a substantially 45° angle on the other side of the vertical when a slanting force is applied to the rod during exercise.

4,227,689

EXERCISING DEVICE INCLUDING LINKAGE FOR CONTROL OF MUSCULAR EXERTION REQUIRED THROUGH EXERCISING STROKE

Dennis L. Keiser, Sanger, Calif., assignor to Kintron, Incorporated, Calif.

Filed Jul. 24, 1978, Ser. No. 927,143
Int. Cl.[3] A63B 21/00
U.S. Cl. 272—130 11 Claims



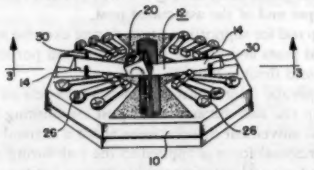
1. An exercising device comprising an exercising member, means mounting said member for movement in a substantially arcuate path, means for resisting said movement, a linkage interconnecting the resisting means and the member for operation of said resisting means upon movement of the member and composed of first and second portions interconnected for pivotal movement about a first pivot point and said second portion connected to the member for pivotal movement about a second pivot point, and a stop borne by said member and engageable by the second portion when the member reaches a predetermined position in said path to fix the second portion relative to the member to cause pivotal movement about the first pivot point during continued movement of the member in the path beyond said predetermined position.

4,227,690

REACTION GAME APPARATUS

Alan R. Pitkanen, 3120 Ocean Dr., Manhattan Beach, Calif. 90266

Filed Nov. 13, 1978, Ser. No. 959,770
Int. Cl.[3] A63F 7/02, 9/04
U.S. Cl. 273—1 R 4 Claims



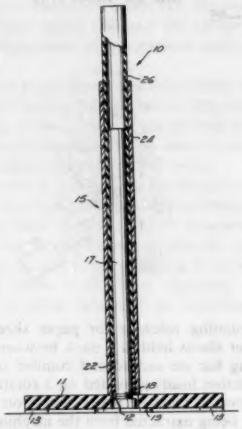
2. A game apparatus including: a base having a channel therein with inclined ramp means formed at the sides of the channel; a die having a plurality of faces; and a pair of stub axles extending coaxially from the opposite sides of the die to be received on the inclined ramp means so as to permit the die to roll down the ramp means to a position in which the die comes to rest with one of its faces in an exposed position, and which includes a plurality of flippers pivotally mounted along selected sides of the base for arcuate movement perpendiculr to the base of each of said flippers from an outer position to an inner position in which the distal end thereof covers the exposed face of the die.

4,227,691

BATTING TEE

James K. Lefebvre; Benny M. Lefebvre, both of Playa Del Rey, and Gilbert H. Lefebvre, San Juan Capistrano, all of Calif., assignors to Lefebvre, Inc., San Juan Capistrano, Calif.

Filed Sep. 28, 1978, Ser. No. 947,171
Int. Cl.[2] A63B 69/40
U.S. Cl. 273—26 R 9 Claims



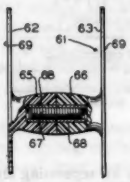
4. A batting tee, comprising:
a planar base;
length-adjustable means for supporting a ball above said base, said length-adjustable means comprising:
an outer tubular member;
an inner tubular member slidably engaging the interior of said outer tubular member and having one end extending externally of said outer tubular member for receiving said ball; and
an elongate pipe extending longitudinally into the interior of said inner tubular member so that said inner tubular member is slidable between said pipe and said outer tubular member;
means in said base for defining a plurality of positions at which said length-adjustable means may be attached to said base; and
means for removably connecting said pipe to said base at a preselected one of said plurality of positions.

4,227,692

DUAL GAME BALL PADDLE

Bertrand Castelli, c/o Myron Salisian, Esquire, 251 S. Lake Ave., Suite 701, Pasadena, Calif. 91101

Continuation-in-part of Ser. No. 948,658, Oct. 5, 1978. This application Nov. 6, 1978, Ser. No. 958,059
Int. Cl.[3] A63B 59/00
U.S. Cl. 273—67 R 4 Claims



1. A projectile striking paddle for a game in which a projectile is struck by a player and comprising an obverse striking

panel, a reverse striking panel, each of said panels having an outer, substantially planar striking surface; a post joining said striking panels such that each panel is spaced from the other striking panel an interval sufficient to accept a player's hand turned palm toward a panel between said striking panels, said post having an obverse post and a reverse post, means engaging each of said striking panels with said post, and separable means securing said obverse and reverse posts together such that said panels are substantially parallel,

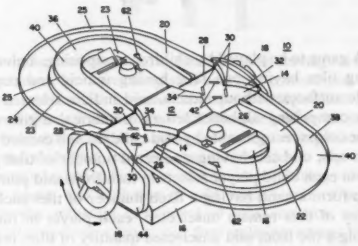
said separable means defining means for selectively disconnecting one of said striking panels from the other of said striking panels.

4,227,693

TOY RACING TRACK

Walter Moe, Los Angeles, Calif., and Charles M. Diker, New York, N.Y., assignors to Diker Moe Associates, West Los Angeles, Calif.

Filed Dec. 6, 1978, Ser. No. 966,875
Int. Cl.³ A63F 9/14
U.S. Cl. 273—86 C **2 Claims**



1. A toy racing track comprising a generally oval track divided into at least two sections; means for suspending said sections adjacent one another to provide a complete track, said means including a central base portion and flexible track connecting each of said sections to the central base portion; and means for controlling at least one of said suspended sections to incline upwardly and downwardly from the other of said sections.

4,227,694

AIM-ASSISTING GOLF PUTTER

Robert C. Drake, 37971 Huron Pointe Dr., Mt. Clemens, Mich. 48045

Filed Sep. 20, 1978, Ser. No. 943,783
Int. Cl.³ A63B 53/00
U.S. Cl. 273—164 **4 Claims**

1. An aim-assisting golf putter, comprising

an inverted T-shaped putter head having an upstanding central neck portion and also having a forward face with a substantially flat central ball-impact area thereon,

an upstanding putter shaft having at its lower end a lowermost head connection portion secured to and rinsing from said central neck portion of said head above said central ball impact area and having an upper end disposed in close proximity to said head,

said shaft having a central substantially horizontal ball-aiming lower portion connected to said upper end of said head connection portion and projecting forward therefrom beyond said head with a forward end disposed forward of said ball impact area in forwardly-spaced relationship thereto,

said shaft having an upwardly-directed rearwardly-inclined intermediate portion with a lower end connected to said forward end of said lower portion and with an upper end disposed remote therefrom,

said shaft having a substantially vertical upper portion connected to and rising from said upper end of said intermediate portion,

and an elongated substantially vertical handle connected to and rising from said upper portion of said shaft,

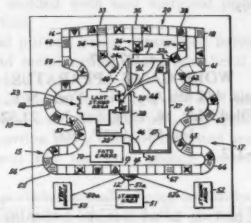
said lower shaft portion and said intermediate shaft portion being disposed in a substantially vertical plane perpendicular to and intersecting said ball-impact area, whereby said plane is substantially coincident with the intended trajectory of the ball to the cup.

4,227,695

BATTLE OF THE ALAMO GAME

Charles M. Neal, Jr., 1145 Buschong, Houston, Tex. 77039

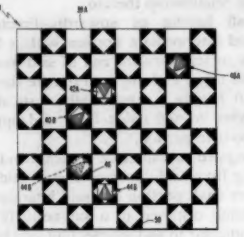
Filed Jan. 22, 1979, Ser. No. 5,582
Int. Cl.³ A63F 3/00
U.S. Cl. 273—255 **4 Claims**



1. Game, simulating the Battle of the Alamo, comprising a game board bearing a game pattern depicting the Alamo and routes of attack against the Alamo; said pattern including a start space spaced from one side of the Alamo, a series of side by side spaces extending in a path spacedly disposed around the Alamo and two adjacent spaces thereof having a common side with said start space, past which said path extends, plural branch paths each extending from said path toward the Alamo at the other side thereof from said start space and each comprising a plurality of side by side spaces the terminal one of which is spacedly adjacent the Alamo; said path providing two opposite attack routes from said start space to said branch paths one or the other of which is selected by each attacking player leaving said start space; said pattern including a walled courtyard area adjacent the Alamo toward which said branch paths are directed, and arrow means disposed across said courtyard area from adjacent the inner end of each said branch path and merging to a common arrowhead directed toward the Alamo; a first plurality of markers each representing an individual of a defending force for use by a defending player in defense of the Alamo; at least one additional plurality of markers each representing an individual of an attacking force and each said additional plurality of members being for use by an attacking player in attack of the Alamo; a separate distinctive marker for each said attacking player for use in movements from said start space and along said path and branch paths in attack of the Alamo in response to throws of one or more dice;

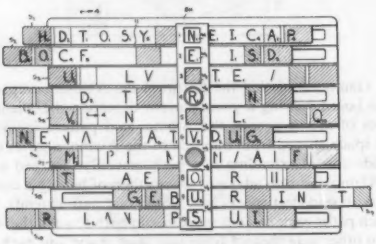
and dice means for use by the defending and attacking players during play of the game.

4,227,696
BOARD GAME
Irving Silverman, 454 Riverside Dr., New York, N.Y. 10027
Filed Nov. 6, 1978, Ser. No. 957,699
Int. Cl.³ A63F *3/02*
U.S. Cl. 273—260 **11 Claims**



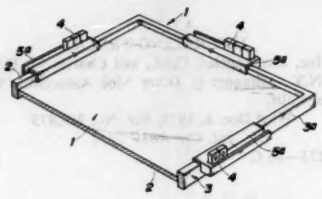
4. A board game comprising a board having playing areas and a plurality of sets of pieces positionable on said playing areas, each playing area having a smaller attack area therein oriented at an angle relative to said playing area and corresponding in shape to said pieces such that a piece can be turned within a given playing area to become aligned with said attack area, said playing areas shaped as squares and said attack areas shaped as smaller squares oriented at 45 degrees relative to said playing squares.

4,227,697
WORD GAME APPARATUS
George Castanis, 444 6th Ave., New York, N.Y. 10011
Filed Mar. 16, 1979, Ser. No. 21,320
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—272 **3 Claims**



1. Word game apparatus comprising:
(A) a multi-channel slide holder of synthetic material having open channels which lie in parallel relation and are transversely bridged at the holder midpoint by a narrow crosspiece having a read-out column of windows therein, each window overlying a respective channel; and
(B) a strip formed of cardboard having a length substantially equal to the length of the slide holder slidable in each channel of the holder and provided with a series of letters which are exposed in said open channels and are in a non-alphabetical sequence, a letter being selected for display through the channel window by shifting the strip relative to the crosspiece, some of said windows having a circular formation and others a square formation for purposes of scoring bonus points, said letters on the strips together constituting a treasury containing all letters in the alphabet in a frequency depending on their usage in everyday words, each letter being valued numerically by a subscript inversely with respect to its frequency.

4,227,698
TABLE GAME
Saburo Ishizuki, Tokyo, Japan, assignor to Kabushikikaisha Anoa, Tokyo, Japan
Continuation of Ser. No. 784,520, Apr. 4, 1977, abandoned. This application Mar. 14, 1979, Ser. No. 20,548
Int. Cl.³ A63F *1/00, 1/10*
U.S. Cl. 273—309 **2 Claims**



2. A game to be played by children comprising, a plurality of playing tiles having one face having indicia and remaining outside surfaces without indicia, said indicia selected from a group comprising alphabet letters, numerical digits, designs and/or colors recognizable by said children and carried by said tiles in sets, said sets having a selected number of tiles per set, wherein each child player selects in turn from said plurality of tiles to form a hand having a fixed number of tiles such that a quantity of tiles remain unselected, each player in turn then selecting a tile from said unselected quantity of tiles, matching said selected tile with said tiles previously selected and discarding an unmatched tile until said hand contains matching sets, which includes a playing board means on which to play said game having a flat horizontal inner playing surface and a continuous frame rail surrounding a perimeter of said surface and joined thereto, said frame rail having a top edge above said surface, a plurality of tile holding racks for holding said tiles slidably and removably mounted on said rail frame, said plurality equalling the number of said children playing said game, each of said racks having an inverted U-shaped portion slidably positioned over said frame rail and carried thereby and having an elongated U-shaped portion to support said fixed number of said tiles selected by said player to form his hand, said elongated portion being integrally connected to said inverted U-shaped portion.

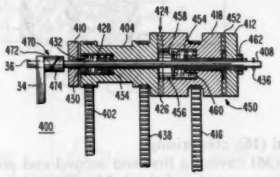
4,227,699
MANUAL SCANNING MECHANISM FOR VIDEO DISC PLAYER
Leslie A. Torrington, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.
Filed Nov. 29, 1978, Ser. No. 964,530
Claims priority, application United Kingdom, Feb. 13, 1978, 05730/78
Int. Cl.³ G11B *17/06*
U.S. Cl. 274—13 R **6 Claims**

1. A player for use with a disc record; said player comprising:
(A) a turntable for centering and supporting a record;
(B) means for rotating said turntable;
(C) a pickup stylus for recovering prerecorded signals from a turntable-supported record during playback;
(D) A carriage for supporting said pickup stylus;
(E) means for causing motion of said pickup stylus relative to said carriage between a depressed position, permitting stylus/record engagement, and an elevated position, precluding stylus/record engagement;

(F) common carriage translating means including a first endless drive belt disposed about a first pair of pulleys;

(G) means for securing said carriage to said first endless drive belt;

(H) first means for utilizing said common carriage translating means for translating said carriage toward the center of said turntable at a speed correlated to the speed of rotation of said turntable while said stylus motion causing means permits said stylus/record engagement; wherein said first utilizing means includes a second endless drive belt disposed about a second pair of pulleys; one of said second pair of pulleys being disposed coaxially with one of said first pair of pulleys; and



(I) second means for utilizing said common carriage translating means for translating said carriage toward and away from said turntable center at a speed independent of the speed of rotation of said turntable while said stylus motion causing means allows said stylus/record engagement;

wherein said first utilizing means includes a slip clutch means interposed between said common carriage translating means and said one of said second pair of pulleys, whereby wresting of control of said common carriage translating means from said first utilizing means by said second utilizing means is permitted by said slip clutch means upon activation of said second utilizing means.

4,227,700

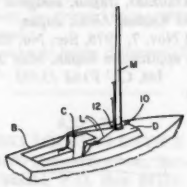
MAST COLLAR SYSTEM

Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

Filed Jan. 2, 1979, Ser. No. 131

Int. Cl.[3] F16J *15/06*; B63B *21/04*; B63H *9/06*; E02D *27/42*

U.S. Cl. 277—12 **19 Claims**



1. A mast collar system comprising

A. a rigid collar for loosely encircling a mast at the location where the mast projects through an opening in a boat deck or other surface, a portion of the collar being arranged to engage and be secured to the boat deck outboard of the opening therein,

B. a flexible resilient ring for engaging around the mast, said ring having an annular portion arranged and adapted to be positioned in the annular gap between the mast and the collar encircling the mast to provide a resilient gasket between the mast and the collar,

C. means defining an annular groove in the top of the ring, said groove extending down into the ring, and

D. a spline arranged to be pressed down into said groove so as to compress the ring portion positioned between the mast and the collar.

4,227,701

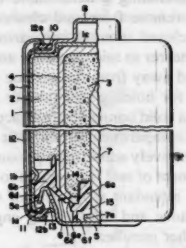
RUPTURABLE SEALING STRUCTURE OF CELL

Takashi Tsuchida, Kosai; Kenichi Shinoda, Toyohashi, and Takao Takase, Arai, all of Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Jan. 2, 1979, Ser. No. 761

Int. Cl.[3] H01M *2/12*; F16J *15/00*

U.S. Cl. 277—12 **6 Claims**



1. In an alkaline cell of the type including a metal casing having a free end, a terminal plate at said free end, a collector metal rod extending inwardly from said terminal plate, whereby internal gas pressure is developed within said cell, and a rupturable sealing structure for sealing said cell, the improvement wherein said rupturable sealing structure comprises:

a sealing gasket including a circumferential marginal portion, a center collar portion, and an intermediate portion integrally molded with said marginal portion and said collar portion;

said marginal portion being constricted between said free end of said metal casing and a peripheral edge of said terminal plate;

said intermediate portion having a thin wall portion which is tearable upon a stretching force being applied thereto;

said collar portion being slidably mounted around said collector metal rod for axial sliding movement relative thereto;

said collar portion normally being inwardly spaced from said terminal plate, but said collar portion being slidable along said collector metal rod toward said terminal plate upon the development within said cell of abnormally high internal gas pressure, whereby said thin wall portion is stretched and ruptured and the gas is released from within said cell.

4,227,702

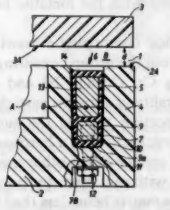
INFLATABLE SEALING DEVICE

Kurt Thate, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,193

Int. Cl.[2] F16J *15/46*

U.S. Cl. 277—34.3 **14 Claims**



1. A device for sealing a clearance between a first space and

a second space wherein the pressure exceeds, at least at times, the pressure in said first space, particularly for sealingly separating the interelectrode gap of an ionography imaging chamber from the surrounding atmosphere, comprising first and second members respectively having first and second surfaces disposed at the opposite sides of and flanking said clearance, the surface of one of said members having a recess extending substantially transversely of said clearance; a seal mounted in said recess and including a deformable hollow tubular first section which is remote from said clearance and completely surrounds an enclosed internal compartment, and a second section which is nearer to said clearance and is movable in said recess toward and away from the surface of the other of said members; means for holding said tubular first section in said recess, including a solid connector fully accommodated in said enclosed internal compartment of said first section of said seal; and means for selectively admitting a pressurized fluid into said internal compartment of said first section to thereby inflate said first section with attendant movement of said second section across said clearance and into sealing engagement with the surface of said other member.

4,227,703

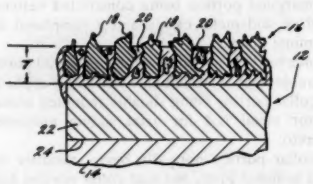
GAS SEAL WITH TIP OF ABRASIVE PARTICLES

Kenneth W. Stalker, Cincinnati; John W. Zelahy, West Chester, and Norman P. Fairbanks, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 863,017, Dec. 21, 1977. This application Nov. 27, 1978, Ser. No. 963,865

Int. Cl.[2] F01D *5/20, 11/08;* **F16J** *15/44*

U.S. Cl. 277—53 **4 Claims**



1. In a gas seal comprising a stationary member and a movable member, the members being in juxtaposition to provide therebetween a gas seal, one of said members including a projection, directed toward a surface of the other member, the projection having a metallic body and an abrasive outer tip which cooperates with said surface to inhibit gas flow therebetween, the improvement wherein:

the tip of said projection is a composite of an inner tip portion and an outer tip portion,

the inner tip portion comprising a shaped member discrete from the projection body, of an alloy resistant to oxidation, sulfidation and thermal fatigue at operating temperatures, and bonded with the metallic body of the projection, and

the outer tip portion comprising a matrix based on an element selected from the group consisting of Cr, Co, Ni and alloys including Cr, Co and Ni and in which there is entrapped a plurality of abrasive particles protruding from said outer tip portion toward the surface of the other member, the particles having a hardness greater than the hardness of said surface of the other member, the outer tip portion bonded with said inner tip portion,

the thickness of the matrix being less than the longest dimension of the abrasive particles in the direction of their protrusion from the outer tip portion.

4,227,704

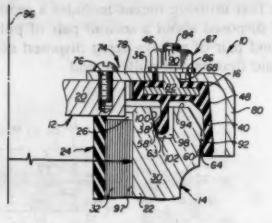
SEAL

James G. Biaha, Painesville, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 12,162, Jan. 18, 1979. This application Jan. 7, 1980, Ser. No. 110,282

Int. Cl.[3] F16J *15/32, 15/34*

U.S. Cl. 277—84 **20 Claims**



1. A seal (16), comprising:

a body (36) having a first and second end portions (50,52) and first, second and third sides (42,44,46), said first and third sides (42,46) being oriented generally opposite one from the other, said second side (44) extending between said first and third sides (42,46);

a first leg (38) having a sealing surface (58) and being connected to said first end portion (50) of the body (36) and extending outwardly from said first side (42) of said body (36);

a second leg (40) having a sealing surface (60) and being connected to said second end portion (52) of said body (36) and extending outwardly from said first side (42) of said body (36); and

a fastening element (68) connected to said body (36) and being oriented opposite of said outward extension of said first and second legs (38,40) from said body (36) and extending outwardly from said third side (46) of said body (36).

4,227,705

SEMICIRCULAR PLUG FOR PREVENTING LEAKAGE OF OIL IN A CYLINDER HEAD OF AN OVERHEAD CAM SHAFT ENGINE

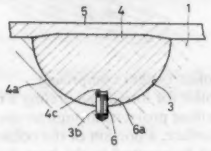
Akio Kuramoto, Okazaki, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Nov. 7, 1978, Ser. No. 958,396

Claims priority, application Japan, May 30, 1978, 53-65561

Int. Cl.[3] F16J *15/02*

U.S. Cl. 277—160 **2 Claims**



1. A semicircular plug assembly in a cylinder head, having a pinhole formed therein, of an overhead cam shaft engine having a plurality of bearings in the upper portion thereof comprising:

a semicircular plug fitted in a semicircular recess formed in either end of said cylinder head in axial alignment with said bearings, said semicircular plug having a semicircular outer periphery and a pin hole provided in the center of said outer periphery; and,

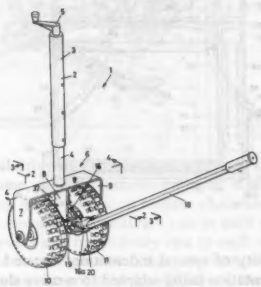
a pin bedded in said pin hole formed in said cylinder head in the center of said semicircular recess and received in said pin hole of said outer periphery of said semicircular plug.

4,227,706

TRACTION DEVICES FOR TOWED VEHICLES

Lionel G. Morris, 17 Ferguson Ave., Myrtle Bank, South Australia 5064, Australia

Filed Jan. 5, 1979, Ser. No. 1,062
Claims priority, application Australia, Jan. 11, 1978, PD3008; Oct. 5, 1978, PD6242
Int. Cl.[3] B60K 9/00
U.S. Cl. 280—3 5 Claims



1. A traction device for a towable vehicle of a type including an extendable portion adapted to be held to a draft frame, the extendable portion engaging a frame holding two ground engageable wheels, and a pair of drive means each for individual engagement with a wheel to rotate the same, and including a lever arm means pivotally secured relative to the frame, the arrangement being characterised according to this invention in that the said drive means comprise in each case a ratchet supported by the lever arm means so as to be movable with respect to the arm and engageable in a ratchet manner with respect to the wheel, the ratchet being adjustably supported so that in one position of the ratchet, an oscillatory movement of the lever arm means about its pivot support will result in rotation of the wheel around in one direction and with the ratchet in a second position, such oscillatory movement of the lever arm means will result in rotation of the wheel around in opposite direction to the first said direction, the lever arm means being thereby effective to both steer the ground engageable wheel and effect a driving rotation and,

each of the said wheels being differentially rotatable about its central axis.

4,227,707

SKI LOCKING DEVICE

Forrest E. Baker, 1891 Foxworthy Ave., San Jose, Calif. 95124, and George N. Sasaki, P.O. Box 61121, Sunnyvale, Calif. 96088

Filed Jul. 31, 1978, Ser. No. 929,838
Int. Cl.[2] A63C 11/02
U.S. Cl. 280—814 9 Claims

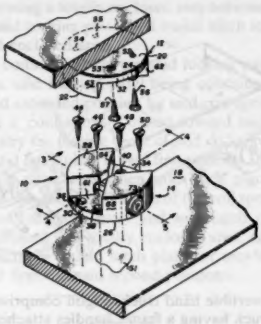
1. A ski locking device comprising:

a first interlocking member including a generally cylindrical first body having a cylindrical first base portion at one end and first and second pie-shaped interlock portions located diametrically opposite each other and extending from said first base portion along at least one half the axial length of said first body, said first body including an opening forming a communicating passageway between said first pie-shaped portion and said second pie-shaped portion;

first means for fastening said first base portion to one of a pair of skis;

a second interlocking member including a generally cylindrical second body having a cylindrical second base portion at one end and third and fourth pie-shaped interlock portions located diametrically opposite each other and extending from said second base portion along at least one half the axial length of said second body, said third and fourth interlock portions being separated by a diametrical slot extending from the top of said second base portion to the distal ends of said third and fourth interlock portions, said third interlock portion being provided with a bore including an aperture opening on said diametrical slot;

second means for fastening said second base portion to the other one of a pair of skis; and



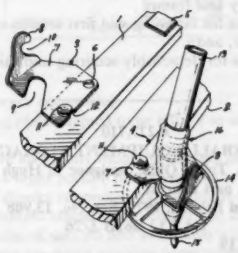
lock means disposed within said bore and including a locking pin for extending through said aperture to matingly engage said passageway when said first and second interlocking members are mated together with said first and second portions interdigitally disposed relative to said third and fourth portions, said ski locking device thereby serving to affix the two skis together at an angle relative to each determined by the angular orientation of said first and second interlocking members relative to the respective skis.

4,227,708

SKI BRAKE

Bernard Cote, 12,270 rue St-Evariste, Montreal, Quebec, Canada (H4J 2B7)

Continuation-in-part of Ser. No. 823,332, Aug. 10, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,808
Int. Cl.[3] A63C 7/00
U.S. Cl. 280—809 9 Claims



1. A ski brake assembly comprising a plate operatively securable to a ski and including an attachment portion securable to the ski and a ski pole catching portion projecting from the attachment portion laterally from the ski on the outward side thereof and defining a rear edge with a hooking notch opening at said rear edge, extending in said ski pole catching portion, and forming in the latter a ski pole hooking portion projecting transversely inward toward the ski and rearward of an inner

portion of the ski pole hooking notch whereby a ski pole laterally engaging in said notch is operatively restrained longitudinally of the ski by said ski pole hooking portion.

4,227,709

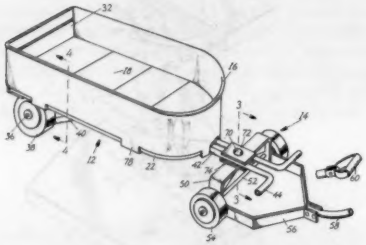
CONVERTIBLE HAND TRUCK-WAGON

Donald R. Gradwohl, and Jonald R. Gradwohl, both of 20843 SW. WillapaWay, Tualatin, Oreg. 97062

Continuation-in-part of Ser. No. 871,007, Jan. 20, 1978, abandoned. This application Dec. 4, 1978, Ser. No. 962,092

Int. Cl.³ B62B *1/04, 3/02*

U.S. Cl. 280—47.11 **3 Claims**



2. A convertible hand truck-wagon comprising

a hand truck having a frame, handles attached to the frame, said handles extending outwardly therefrom, a pair of wheels rotatably mounted on the lower end of the frame, and a lift plate attached to said lower end, extending substantially perpendicular thereto,

a steerable front wheel assembly mountably fastenable to said handles to form a wagon having steerable front wheels,

a lift plate extension member pivotally attached to said lower end for swinging between extended and retracted positions, wherein the extension member occupies a plane which is substantially parallel to planes occupied by the lift plate and the frame, respectively,

a floor member including first, second and third sections pivotally connected edge-to-edge for selected folding between a substantially planar configuration, wherein said member may be detachably mounted on said frame to form a floor thereof, and a folded configuration wherein said first, second and third sections form the back, seat and seat support portions, respectively, of a seat which is mountable on said hand truck, with said first section being disposed adjacent said extension member, when the latter is in its extended position, and with said third section being supported by said frame,

fastening means for fastening said first section on said extension member, and

securing means for detachably securing said third section to said frame.

4,227,710

MOBILE BASEBALL EQUIPMENT STORAGE DEVICE

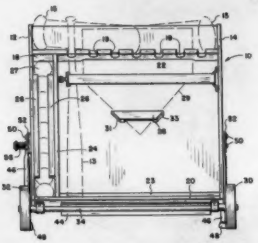
Bernard C. Laub, Tulsa, Okla., assignor to Hugh J. Finnerty, Tulsa, Okla., a part interest

Filed Feb. 22, 1979, Ser. No. 13,988

Int. Cl.³ B62B *1/26*

U.S. Cl. 280—47.19 **5 Claims**

1. A mobile baseball equipment storage device comprising a substantially rectangular upright back panel having an upper edge, a lower edge and a pair of spaced parallel side edges; a pair of parallel vertical side members connected along the side edges of said back panel and extending outwardly on one side of said back panel substantially at right angles thereto; a bottom shelf extending horizontally along the lower edge of said back panel between said side members; a top shelf extending horizontally between said side members at a location spaced from the upper edge of said back member; an intermediate vertical member spaced between said two side members and adjacent one of said side members extending vertically between said bottom shelf and said top shelf and forming with said adjacent side member a vertical compartment for the storage of baseballs therein; vertical strips located on said intermediate side member and said adjacent side member and extending from a position spaced below said upper shelf to a position spaced above said lower shelf to retain the baseballs in said vertical compartment; said upper shelf having a plurality of spaced slots, each of which is adapted to receive the upper handle portion of a baseball bat; said lower shelf member having a plurality of spaced indentations located below said slots, each indentation being adapted to receive the lower end of a baseball bat; a detachable strap means extending from said intermediate vertical member to the side member opposite from said adjacent side member for holding said bats in said storage device; a pair of spaced wheels mounted on said device to permit the rolling thereof; a handle on said device, and a foldable stand mounted on said device and adapted in one position of said stand to maintain said storage device in a substantially upright position and in a second position of said stand being folded out of the way to permit the rolling movement of said device.



4,227,711

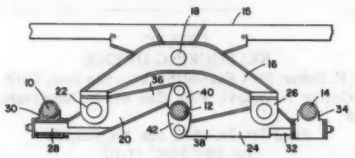
3-AXLE WALKING BEAM SUSPENSION

John G. Wheeler, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 25, 1978, Ser. No. 945,676

Int. Cl.³ B62D *21/00*

U.S. Cl. 280—81 R **4 Claims**



3. An improved three-axle walking beam suspension of the type having a primary beam pivotally mounted at an intermediate point to the frame of a vehicle and two secondary beams pivotally mounted at intermediate points to the ends of said primary beam, the secondary beam being rotatively connected at the respective outer ends to the front and rear vehicle axes, the improvement comprising:

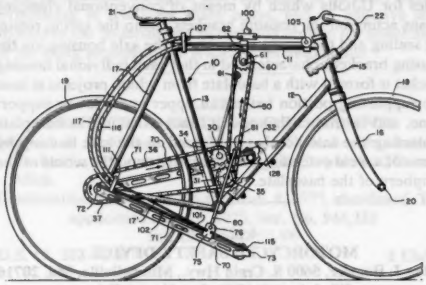
the intermediate axle extending across the front portions of said rear secondary walking beams and the rear portions of said front secondary walking beams such that said front and secondary walking beams are pivotally connected to said intermediate axle.

4,227,712

PEDAL DRIVEN VEHICLE

Timber Dick, P.O. Box 611, Burlingame, Calif. 94010

Filed Feb. 14, 1979, Ser. No. 11,782
Int. Cl.[3] B62M *15/00, 1/04, 1/06*
U.S. Cl. 280—236 **4 Claims**



1. A pedal driven vehicle such as a bicycle or the like comprising a frame, propelling means mounted in said frame, a pair of oscillating pedal levers, an endless chain and two pull and push rods connected respectively one to each of said oscillating pedal levers and respectively one to each run of said endless chain so as to impart oscillatory movement to said endless chain by the movement of said pedal levers, two parallel shafts, gearing associated with each of said shafts connected to oscillate with said endless chain, sprockets associated with each of said shafts and connected to drive said propelling means, and a one way clutch associated with one of said shafts and a second one way clutch associated with the other of said shafts said clutches each being constructed to alternately drive said sprockets in the same direction in response to the oscillatory movement of said gearing.

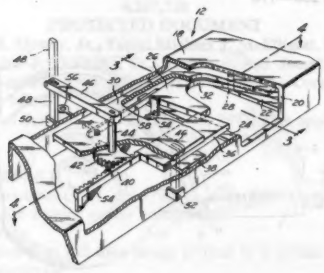
2. The vehicle defined in claim 1 further characterized in that said vehicle also has means for simultaneously moving the point of connection between each of said pull and push rods and its associated pedal lever along the length of said pedal levers respectively in the same direction at the same time so as to change the effective arms of said pedal levers and to thus change the driving ratio effective to propel said vehicle at any particular time.

4,227,713

TRAILER HITCH LATCHING ASSEMBLY

Raymond W. Blodgett, Jr., and Raymond W. Blodgett, both of 10961 Huber St., Anaheim, Calif. 92804

Filed Mar. 12, 1979, Ser. No. 19,830
Int. Cl.[3] B62D *53/12*
U.S. Cl. 280—434 **5 Claims**



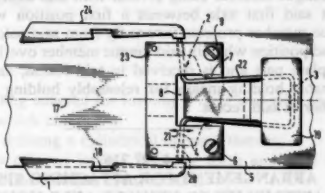
1. A trailer hitch latching assembly comprising:
a housing;
an opening located within said housing, said opening to accommodate a trailer hitch;
a locking pawl attached to said housing and located within said opening, said locking pawl being movable between a retracted position exterior of said opening to an extended position across said opening;
a latch plate mounted on said housing and across said opening, said latch plate being movable between a first position and a second position, said first position engaging said locking pawl and preventing movement of such to said extended position, said second position disengaging said locking pawl permitting such to move to said extended position forming a totally enclosed area between said latch plate and said locking pawl, said trailer hitch to be located within said enclosed area;
a coil spring connected between said locking pawl and said latch plate, said locking pawl being continuously biased toward said extended position by said coil spring and said latch plate is continuously biased toward said first position, whereby the biasing force of said coil spring tends to maintain said latch plate in said first position and engaging said locking pawl, and when said latch plate is in said second position the biasing force of the coil spring tends to maintain said locking pawl and said latch plate in the position defining said totally enclosed area; and
means connectable to said latch plate for moving such between said first and said second positions.

4,227,714

AUTOMATIC SKI BRAKE USING STIRRUP-SHAPED SPRING WIRE

Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to Etablissements François Salomon et Fils, Annecy, France

Continuation of Ser. No. 665,788, Mar. 10, 1976, Pat. No. 4,078,824, which is a continuation-in-part of Ser. No. 557,476, Mar. 12, 1975, Pat. No. 3,989,271. This application Mar. 10, 1978, Ser. No. 885,182
Claims priority, application Fed. Rep. of Germany. Mar. 5, 1974, 2412623; Jul. 26, 1974, 2436155; Feb. 20, 1975, 2507371
The portion of the term of this patent subsequent to Mar. 14, 1995, has been disclaimed.
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **3 Claims**



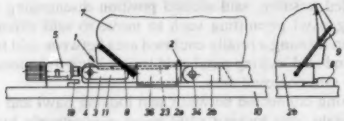
1. A ski brake comprising:
a mounting plate adapted to be affixed to an upper surface of a ski;
a bent wire swingably mounted on said mounting plate and having a bight portion positioned above said surface and a pair of shanks connected by said bight portion;
a brake element connected to one of said shanks at a longitudinal edge of said ski and swingable with said wire into a first snow-engaging position upon release by a skiboot of said bight portion, said bight portion being displaceable by said skiboot into a second position in which said element lies along said edge;
spring means for urging said element into one of said positions; and
cooperating means on said wire and said plate for moving said brake element toward the longitudinal axis of the ski upon displacement of said bight portion into said second position.

4,227,715

ATTACHMENT FOR RELEASE SKI BINDINGS FOR CROSS-COUNTRY SKIING

Gustav K¹rchmeyr, Innsbruck, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Nov. 2, 1978, Ser. No. 957,081
Claims priority, application Austria, Nov. 11, 1977, 8100/77
Int. Cl.³ A63C 9/086
U.S. Cl. 280—618 6 Claims



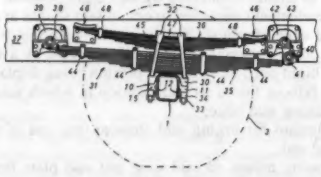
1. In an attachment for use in cross-country skiing and adapted for operative connection to a releasable toe ski binding member having first releasable locking means thereon for normally holding a ski boot for use in downhill skiing, said toe ski binding member being fixedly secured to a ski, said attachment comprising a sole plate and first means for holding said sole plate on said ski, said sole plate including second means for securing said ski boot thereto, said first means including a connecting piece permanently and pivotally connected through a first axle to said sole plate, said first axle being located substantially directly below the toe of said ski boot and extending transversely with respect to the longitudinal axis of said ski, a spring, said spring being adapted to yield to movement of said sole plate upwardly with respect to said connecting piece and about said first axle and second releasable locking means on said connecting piece and on said toe ski binding member separate from said first releasable locking means for permitting said sole plate and the connected connecting piece to be selectively connected to said toe ski binding member, the improvement comprising wherein said sole plate is comprised of first and second sole plate parts connected to each other through a second axle extending parallel to said first axle, wherein said connecting piece has a tongue member thereon forming a portion of said second releasable locking means, another portion being a part of said releasable toe ski binding member, wherein said first sole plate part has a recess therein, said tongue member being pivotal with said connecting piece about said first axle between a first position wherein said tongue member projects forwardly from said sole plate and a second position wherein said tongue member overlays said first sole plate part and is received in said recess, and including releasable holding means for releasably holding said tongue member in said recess.

4,227,716

ARRANGEMENT FOR ATTACHING SPRING ASSEMBLIES TO VEHICLE AXLE HOUSINGS

Sigurd A. M. Nordström, Södertälje, Sweden, assignor to Saab-Scania Aktiebolag, Södertäιηə >γρ

Filed Dec. 19, 1978, Ser. No. 971,062
Claims priority, application Sweden, Dec. 22, 1977, 7714636
Int. Cl.³ B60G 19/02
U.S. Cl. 280—719 12 Claims



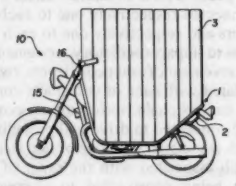
1. Arrangement for attaching a spring assembly to an axle housing in vehicles, preferably the rear axle housing of a lorry, said spring assembly being attached to the vehicle frame or body and via a spring retaining seating or the like being removably secured to housing brackets rigidly mounted on the front and rear side surfaces of the axle housing, said spring retaining seating and housing brackets being provided with through-holes for U-bolts which by means of conventional clamping means acting on the housing brackets clamp the spring retaining seating and the spring assembly to the axle housing via the housing brackets, characterized in that each individual housing bracket is formed with a baseplate from which projects at least one supporting portion having an upper and a lower support plane, and in that each housing bracket having its baseplate contacting the axle housing is secured to the axle housing by means of a weld extending substantially round the whole of the periphery of the baseplate.

4,227,717

MOTORCYCLE SAFETY DEVICE

Julien J. Bouvier, 5600 S. Crain Hwy., Mitchellville, Md. 20716

Filed Apr. 4, 1979, Ser. No. 26,596
Int. Cl.³ B60R 21/02
U.S. Cl. 280—753 4 Claims



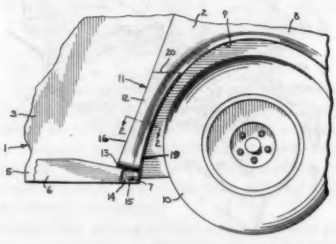
1. A safety device for a motorcycle comprising, in combination, a frame having releasably interconnected portions mounted on the motorcycle, said frame completely surrounding a rider seated on the motorcycle, an inflatable cocoon disposed within said frame, a source of pressurized air connected to said cocoon, means for activating said source of pressurized air to inflate said cocoon and release said interconnected portions of said frame whereby said cocoon in the inflated condition completely surrounds said rider for protection against injuries.

4,227,718

STONE GUARD FOR AUTOMOBILE FENDER

Donald M. Durben, Rte. 3, Fond du Lac, Wis. 54935

Filed May 3, 1979, Ser. No. 35,684
Int. Cl.³ B62D 27/00
U.S. Cl. 280—770 5 Claims



1. A stone guard to be attached to an automobile fender adjacent the wheel opening to prevent stone chipping of the fender, comprising a body section having a cross sectional

configuration to conform to the contour of the fender bordering the wheel opening, a flange disposed along the forward edge of the body section and disposed generally normal to the body section and adapted to engage the door jamb of the automobile, a lower flange disposed along the lower edge of the body section and adapted to be attached to the rocker panel of the automobile, the upper and rear edges of the body section terminating in relatively sharp edges, and an adhesive strip applied to the undersurface of the body section for attachment of the body section to the fender of an automobile.

4,227,719

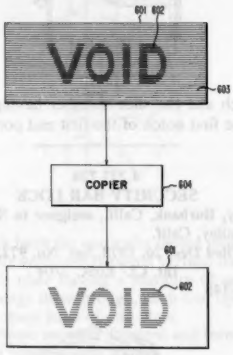
PROTECTION SYSTEM FOR DOCUMENTS

Michael J. McElligott, and Victor J. Tkalenko, Jr., both of Rochester, N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 766,590, Feb. 8, 1977, abandoned. This application Sep. 20, 1978, Ser. No. 944,233

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—8 R **3 Claims**



1. A document for deterring nefarious color reproduction thereof upon a color copier comprising:

a substrate,

a background camouflage printed on the entire area of said substrate of a first density, and

a warning mark also printed on said substrate of a second density such that there exists in the area of said warning mark an area of a third density which is cumulative of said first and second densities, such that the third density area is reproduced by a color copying machine, the camouflage and mark being of densities which are not reproduced by a color copying machine.

4,227,720

PROTECTED DOCUMENT

William H. Mowry, Jr., Tonia; Michael J. McElligott, Rochester; Victor J. Tkalenko, Jr., Rochester, and Joseph Baran, Rochester, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 798,219, May 18, 1977. This application Nov. 8, 1978, Ser. No. 958,926

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—8 R **7 Claims**

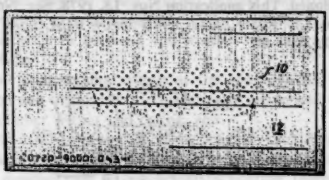
1. A document for deterring a nefarious reproduction thereof upon a color copier comprising:

a substrate;

a first less than full tone image printed in a certain area on said substrate;

a colored background printed on the remaining areas of said substrate; and

a second less than full tone camouflage image printed in an overlay fashion over said colored background and said first less than full tone image, wherein said first less than full tone image is substantially invisible to the human eye when viewed in conjunction with said second less than



full tone image and said background, but which said first less than full tone image is readily apparent upon a reproduction of said document by said color copier.

4,227,721

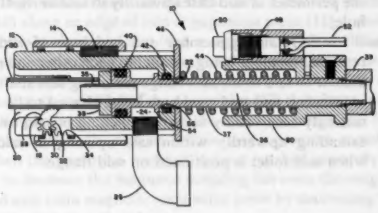
VARIABLE SIZE COUPLING

Wayne R. Reedy, Cazenovia, and Edward F. Russ, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,464

Int. Cl.² F16L *35/00*

U.S. Cl. 285—18 **10 Claims**



1. A coupling adapted for forming a tight seal with various sized tubes which comprises:

a housing defining a cylindrical opening therein;

a plurality of jaws having gripping teeth and gear teeth mounted for rotation about an axis;

means for mounting the jaws to the housing such that the gripping teeth are located at varying radial distances from the axis of rotation and are within and spaced about the opening within the housing;

having rack teeth thereon;

means for mounting the rack means in sliding engagement with the exterior surface of the housing with the rack teeth mechanically engaging the gear teeth of the jaws such that a sliding motion of the rack means results in rotational motion of the jaws;

means defining a fluid passage extending through the housing; and

a seal associated with the fluid passage means and being adapted to abutably receive a tube to be secured in the coupling such that a fluid tight joint is formed between the tube and the fluid passage means, the rotatable jaws engaging the exterior surface of the tube to secure the tube to prevent removal from the coupling once the tube has been inserted therein.

4,227,722

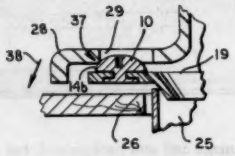
TOILET SOIL PIPE FLANGE FASTENER

Luther J. Barber, 3174 Miller Rd., Lithonia, Ga. 30058

Continuation-in-part of Ser. No. 829,472, Aug. 31, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,689

Int. Cl.[3] **E03D** *11/13;* **F16B** *35/04;* **F16L** *3/00, 23/02*

U.S. Cl. 285—56 **3 Claims**



2. A nut for threadably receiving a fastening means for securing a toilet defining an oval opening therein to a soil pipe flange, said flange including a horizontally disposed annular ring defining an arcuate slot therein, said fastening means being positioned to engage said toilet and extend downwardly through said opening to bias said toilet against said flange, and said nut comprising:

a vertically extending shaft having a diameter slightly less than the width of said arcuate slot and a length slightly longer than the thickness of said annular ring;

a flat lower retaining member underlying said flange and fixed to the lower end of said shaft;

an upper retaining member defining a vertical tapped hole therein, and having a flat base fixed to the upper end of said shaft, said base having an oval perimeter overlying said flange, and said upper retaining member further defining an inclined guiding surface extending uniformly from the perimeter of said base upwardly to said vertical tapped hole;

said lower retaining member and said base of said upper retaining member being parallel to each other and perpendicular to said shaft, said flange receiving said shaft in said arcute slot, and said oval base being shaped to be loosely matingly received by said oval opening in said toilet and extending upwardly within said opening in said toilet when said toilet is positioned on said flange.

4,227,723

MULTIPLE BOLT LATCH

Jean Rosell, Etalondes, France, assignor to Laperche, Friville Escarbotin, France

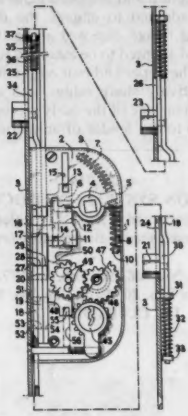
Filed Sep. 12, 1978, Ser. No. 941,679

Claims priority, application France, Sep. 16, 1977, 77 27978

Int. Cl.[2] **E05C** *1/16*

U.S. Cl. 292—34 **7 Claims**

1. A latch comprising a case, a head plate, at least one spring bolt, means for mounting the bolt relative to said plate so that the bolt is movable in a direction parallel to the plane of said plate and a mechanism within the case for actuating the spring bolt, said bolt mounting means comprising a rod which carries the bolt and is disposed behind said plate and has a first end portion remote from the bolt, which first end portion is engaged with the actuating mechanism which comprises a member which defines means for receiving a latch-operating member and includes a first arm and a second arm, elastically yieldable means for maintaining the first arm in position, a slide member slidably mounted in the case and defining a slide member notch, the second arm being engaged in the notch of said slide member, said first end portion of said rod defining a



first rod notch and the slide member having a heel portion engaged in the first notch of the first end portion of the rod.

4,227,724

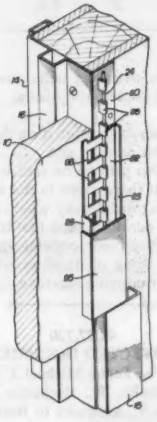
SECURITY BAR LOCK

Robert L. Day, Burbank, Calif., assignor to S.D.S. Industries, Inc., Sun Valley, Calif.

Filed Dec. 26, 1978, Ser. No. 972,907

Int. Cl.[2] **E05C** *1/04*

U.S. Cl. 292—145 **14 Claims**



1. In an apparatus for securing against entry by an unauthorized person, a building door hinged on one side of a door opening:

(a) a door frame structure providing a flange faced to the inside of the door opening and located at a place past which the edge of the door swings;

(b) an elongated bar lock;

(c) means mounting the bar lock on said flange so that the bar lock substantially parallels the adjacent edge of the door opening;

(d) said mounting means confining the bar lock for sliding movement substantially parallel to the plane of the door

opening to project throughout its length over the said edge of the door and to retract to clear it;

(e) said mounting means transmitting door opening pressure exerted on said bar lock to said frame structure; and

(f) means determining stable open and closed positions of said bar lock.

4,227,725

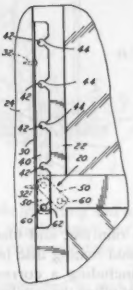
SLIDING CLOSURE LOCK LATCH

Morris W. Lindquist, 24155 Loretta, Warren, Mich. 48091, and Henry P. Hines, 7450 Brentwood, Detroit, Mich. 48234

Filed Dec. 21, 1978, Ser. No. 971,843

Int. Cl.[2] E05C 3/04

U.S. Cl. 292—202 **1 Claim**



1. A safety lock latch for vertically sliding closures having a sash frame slidable vertically between vertical frame members,

(a) an elongate plate having a plurality of spaced, unconnected openings therethrough, each said opening extending to a common edge of said plate,

(b) a vertical frame member adjacent and forming a support for a sliding window sash frame,

(c) means fastening said elongate plate on said frame member adjacent, parallel to, and overlying but spaced from said sash for sliding clearance,

(d) a lock pin to position laterally of said plate dimensioned selectively to enter and engage any one of said spaced openings in said plate, and

(e) a swing plate pivotally mounted on said sash frame between said sash and said elongate frame and carrying said lock pin, said swing plate being movable on a horizontal axis to a release position wherein said lock pin clears said elongate plate to allow free vertical movement of said sash and being movable to a substantially vertical position to engage one of said spaced openings to limit the movement of said sash frame until said swing plate is manually shifted to the release position.

4,227,726

DOOR OPERATING EQUIPMENT

Akira Sorimachi, Yokohama, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Yokohama, Japan

Filed Feb. 9, 1979, Ser. No. 10,959

Claims priority, application Japan, Mar. 20, 1978, 53/31907

Int. Cl.[3] E05C 17/56

U.S. Cl. 292—251.5 **4 Claims**

1. A door operating mechanism having means for magnetically engaging a piece of metal material mounted on a door, said mechanism comprising in combination:

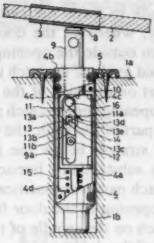
(a) an elongated hollow casing with a closed rear end and an open front end, said front end being disposed to be opposite said metal material when said door is closed;

(b) a magnet with a flat face for supplying a magnetic energy field to by used in holding said metal material magnetically;

(c) an operative member in said casing with a member front end having a main magnetic responsive piece with a piece face disposed alongside said magnet flat face at said front end, said piece being designed to carry magnetic energy to said metal material when pressed against said front end, the strength of said magnetic energy field depending on the contact area between said magnet flat face and said piece face;

(d) a coil compressing spring at the rear of said casing adapted and disposed to longitudinally move said operative member within said casing; and,

(e) a push-latch mechanism in said casing including: and elongated aperture (*9a*) intermediate the ends of said operative member, on an intermediate portion thereof, an engagement piece (**11**) pivotally mounted on said intermediate portion overlapping said elongated aperture (*9a*), a



torsion spring (**10**) interposed between said operative member and the engagement piece (**11**) for biasing the engagement piece (**11**) in one direction, an engagement pin (**12**) protruding from the engagement piece (**11**) through said elongated aperture (*9a*), a curved portion (*11b*) along an edge of said engagement piece (**11**) crossing over said elongated slot (*9a*), a zigzag slot (**13**) at the end of said curved portion (*11b*) extending to the inner side of the engagement piece (**11**) and a raised portion (**14**) defined at an end (*13e*) of the zigzag slot (**13**) thereby to latch said operative member when the operative member is first pushed inwardly and to release said operative member when the operative member is again pushed inwardly so as to decrease the magnetic coupling between the magnet and said main magnetic responsive piece by decreasing the contacting area therebetween.

4,227,727

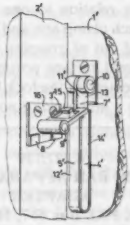
DOORCATCH

Allan G. Westerlund, Norrbackagatan 30, S-113 41 Stockholm, Sweden

Filed Jun. 23, 1978, Ser. No. 918,417

Int. Cl.[2] E05C 17/16

U.S. Cl. 292—270 **4 Claims**



1. A catch for use between a door and a doorframe comprising:

a catch part operatively cooperating with a guide on a latch,

said catch part and latch being rotatably attached to the doorframe and the door, respectively;

said catch part including at least a portion which cooperates with the guide to prevent the removal of said catch part from said guide on said latch except at a recess in the inner end of the guide;

said catch part and said latch being rotatably mounted on horizontal axes;

said latch being mounted on a spindle attached to said door for free up and down movement, and said spindle being arranged at a level above a spindle of said catch part and positioned at a right-angled distance between a mounting plate of said catch part and a central plane through the latch perpendicular to its horizontal axis when the door is closed, such that the portion of said catch part which cooperates with the guide of the latch automatically enters the recess when the door is closed, and cooperates with the guide to force the catch to a locked position automatically, whenever the door is closed either from inside or from outside the opening; and

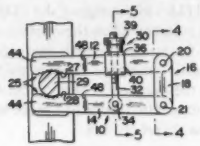
said recess of said guide of the latch including both a port for the catch part on one side of the upper part of the latch and with an opening for the catch part on the opposite side of the upper part of the latch, the opening being arranged to lie nearly straight below the port, when the latch is rotated to a substantially horizontal position, through which the catch part is automatically detachable from the latch at the opening of the door from outside by pushing up on the latch on the spindle of the catch part, followed by a closing of the door.

4,227,728

AUXILIARY LOCK ASSEMBLY

John Zaluski, 503 77th Ave. North, St. Petersburg, Fla. 33702

Filed Jul. 11, 1979, Ser. No. 56,454
Int. Cl.³ E05C *13/02*
U.S. Cl. 292—297 **10 Claims**



1. An auxiliary lock assembly primarily designed to prevent longitudinal displacement of a conventional lock bolt element, said assembly comprising: frame means dimensioned and configured for placement between door edge and a door frame and including two clamp arms movably interconnected to one another, each clamp arm comprising grasping means formed on correspondingly positioned interior edge portion of each arm in spaced apart relation to one another, closing means interconnected to each clamp arm and disposed to position said clamp arms into and out of grasping engagement with oppositely disposed external surface portions of the lock bolt element, whereby movement of the lock bolt along its own longitudinal axis and into a non-locking position is prevented.

4,227,729

ROTATABLE RAM BAR APPARATUS AND CARRIER ADAPTER

John B. Schumacher, P.O. Box 657, Huron, S. Dak. 57350

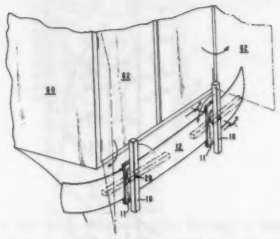
Filed Sep. 28, 1978, Ser. No. 946,723
Int. Cl.² B60R *19/02*
U.S. Cl. 293—145 **8 Claims**

1. A rotatable ram bar apparatus having at least one (1) ram bar assembly for mounting on a vehicle bumper, said assembly comprising:

a ram bar;

means for securing said bar to said bumper; said securing means including a bracket attachable to the outer side of said bumper; and

means for rotating said bar between a first position wherein said bar extends vertically above and below said vehicle bumper and a second position wherein said bar is substantially parallel to said bumper, said rotating means including locking means for holding said ram bar in said first position, said locking means including a camming disc fixedly mounted to the bracket, a mating disc fixedly



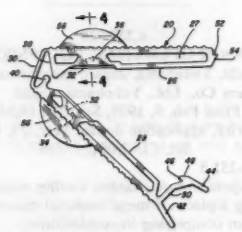
mounted to the ram bar, and biasing means urging said discs together, said mating disc including a key and said camming disc including a corresponding slot, the key engaging said slot when the ram bar is in said first position, and said camming disc including a pair of inclined guide surfaces on the slotted side of said camming disc for facilitating the removal of said key from said slot, and said camming disc including stop means having a pair of steps, each step provided on a respective one of the inclined surfaces on opposite sides of the slot and having oppositely facing abutment surfaces for engagment with a respective one of the opposite longitudinal sides of the key for preventing rotation of said bar beyond said second position.

4,227,730

GRIPPER MEMBER FOR RETENTION OF A PLASTIC TUBE

John B. Alexander, Evanston; T. Michael Dennehey, Arlington Heights; Richard J. Greff, Ingleside, and John M. Munsch, Libertyville, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed May 29, 1979, Ser. No. 43,061
Int. Cl.³ B25B *7/02*
U.S. Cl. 294—16 **11 Claims**



1. A gripper member which comprises: an openable and closable pair of handles interconnected by a hinge member, each handle defining, an arcuate recess positioned to face the corresponding recess of the other handle and defining gripping projections therein, and a wall member positioned longitudi-

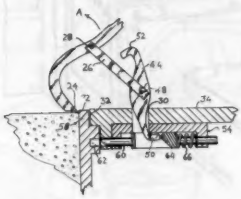
nally on each handle across each arcuate recess and at the same side thereof, whereby a flexible plastic tube may be surrounded and gripped in the arcuate recesses of said handles for rotational retention thereof as a connector member is inserted into or withdrawn from said tube, said wall members pinching said tube into closed, sealed relation when occupying said recesses with the handles in closed position.

4,227,731

TOOL FOR LIFTING AND MANEUVERING UTILITY ACCESS COVERS

Alfred B. Castle, 4104 Maryland Ave., Bethesda, Md. 20016

Filed Oct. 1, 1979, Ser. No. 80,233
Int. Cl.³ B65G 7/12
U.S. Cl. 294—17 **8 Claims**



1. A lifting tool suitable for lifting and maneuvering a utility access cover having an attachment point at or near an outer peripheral edge of said cover, said tool comprising:

(a) a handle;

(b) receiving means connected to said handle for receiving and retaining said utility access cover during lifting and maneuvering thereof;

(c) abutment means for abuttingly engaging said cover when said cover comes into receiving engagement with said receiving means, said abutment means having first and second spaced-apart pivot points, said abutment means being pivotally connected to said handle at said first pivot point;

(d) cover engaging means pivotally connected to said abutment means at said second pivot point for engaging said tool to said attachment point of said cover; and

(e) guiding means connected to said receiving means for guiding said cover into receiving engagement with said receiving means;

said receiving means including a cover engaging surface extending between said guiding means and said abutment means, said cover being slidingly engagable with said cover engaging surface, said cover engaging means and said guiding means cooperating to lift said cover and slidingly urge said cover along said cover engaging surface into abutting engagement with said abutment means upon urging said handle away from said cover,

whereby said cover is brought into engagement with said receiving means and securely retained in said receiving means during lifting and maneuvering of said cover.

4,227,732

PNEUMATICALLY OPERATED GATE FOR HOPPER BOTTOMS FOR BULK HANDLING EQUIPMENT

Gerald J. Kish, 10711 Strasburg Rd., Erie, Mich. 48133

Filed Nov. 24, 1978, Ser. No. 963,222
Int. Cl.³ B60P 1/56
U.S. Cl. 294—71 **7 Claims**

1. A hopper gate mechanism comprising:

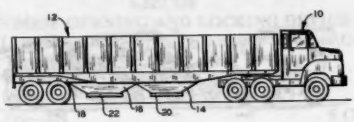
a frame defining a hopper opening;

a pair of doors to open and close the opening in said frame;

hinge means pivotally mounting one edge of each of said doors to said frame;

at least two spaced apart reciprocable latch members having inner latching ends and outer ends, said latch members movable into a first position wherein the inner ends are in latching engagement with respective ones of said doors and into a second position whereby the inner ends are out of latching engagement with said respective ones of said doors;

a draw bar pivotally interconnecting the outer ends of said latch members; and



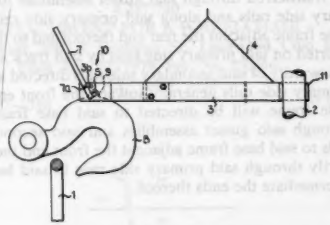
motor means coupled to said draw bar for effecting selected pivotal movement of said draw bar to selectively move said latch members into the second position out of engagement with said respective ones of said doors.

4,227,733

APPARATUS FOR CONNECTING A LIFTING TACKLE TO A SUBMERSIBLE PUMP

Sture Haglund, Sundbyberg, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,932
Claims priority, application Sweden, Nov. 24, 1977, 7713282
Int. Cl.³ B66C 1/38
U.S. Cl. 294—83 R **4 Claims**



1. An apparatus for connecting a lifting tackle to a lifting loop of a submersible pump, said apparatus being adapted to be lowered into a pumping station along essentially vertical guides, comprising:

a connection yoke;

means formed at one end of said connection yoke for slidably engaging said guides; and

means disposed at an opposite end of said connection yoke for releasably securing a lifting tackle in a substantially horizontal position and for automatically releasing said tackle upon contact of the tackle with the lifting loop, said securing means comprising a slidable pin member for engaging the lifting tackle, a spring adapted to urge the pin out of engagement with the lifting tackle, and a stop arm for holding the pin against the spring force until said stop arm is engaged by the lifting tackle and is rotated to release the pin so that the spring slides the pin out of engagement with the lifting tackle, whereby a lifting tackle may be lowered into a pumping station for engagement with the lifting loop of a submersible pump.

4,227,734

CAR HAUL TRAILER

Don J. Cottrell, 2164 Hawthorne La., and Don M. Cottrell, Rte. 7, Duckett Mill Rd., both of Gainesville, Ga. 30501

Filed Jun. 29, 1978, Ser. No. 920,189
Int. Cl.[2] B60P *3/08*
U.S. Cl. 410—12 **12 Claims**

1. A car haul trailer for transporting vehicles comprising:

a base frame having a front end and a rear end;

a pair of spaced apart side frames assemblies mounted on said base frame along opposite sides thereof; each of said frame assemblies including an upstanding, arched primary side rail having opposite ends and a first prescribed radius of curvature, one end of said primary side rail connected to said base frame adjacent the rear end thereof and the other end of said primary side rail connected to said base frame intermediately of the rear and front ends thereof so that said primary side rail projects above said base frame and lies in a generally vertical plane; an upstanding arched secondary side rail having opposite ends and a second prescribed radius of curvature, one end of said secondary side rail connected to said base frame adjacent the front end thereof; and a gusset assembly connecting the other end of said secondary side rail to said primary side rail intermediate its ends; and

a plurality of vehicle supporting track assemblies positioned between and mounted on said side frames to support the vehicles to be transported, said gusset assemblies connecting said secondary side rails to said primary side rails so that forces exerted on said secondary side rails by said track assemblies and directed along said secondary side rails generally toward the rear end of said base frame will be transferred through said gusset assemblies to said primary side rails and along said primary side rails to said base frame adjacent the rear end thereof and so that forces exerted on said primary side rails by said track assemblies rearwardly of said secondary side rails directed along said primary side rails generally toward the front end of said base frame will be directed to said base frame partly through said gusset assemblies and said secondary side rails to said base frame adjacent the front end thereof and partly through said primary side rails to said base frame intermediate the ends thereof.

4,227,735

PROTECTIVE ENCLOSURE FOR A BUS DRIVER

Joseph C. Joyner, Queens Village, N.Y., assignor to Joy-can Safety Products, Ltd., Queens Village, N.Y.

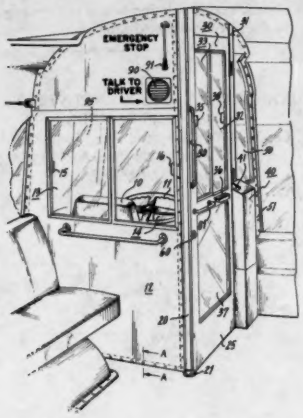
Filed Jan. 18, 1979, Ser. No. 4,455
Int. Cl.[2] B60R *27/00*
U.S. Cl. 296—24 R **10 Claims**

1. A protective enclosure apparatus for a bus driver area, said enclosure mounted in a bus vehicle to surround a driver when operating said vehicle, comprising:

(a) a vertical support extending from the floor to the ceiling of said bus,

(b) a back panel coupled at one side to the side of said bus and coupled to said vertical support at said other side, said back panel extending from the floor to the ceiling of said bus, and having a relatively central area fabricated from a strong transparent material to allow visual access,

(c) a side panel transverse to said back panel and coupled to said vertical support at one end and the front area of said bus at the other end, said side panel extending from the floor to the ceiling of said bus and including a door, said door having a large area fabricated from a strong transparent material to allow visual access, with said back and side panels forming an enclosure about said driver area, with access to said area afforded by said door,



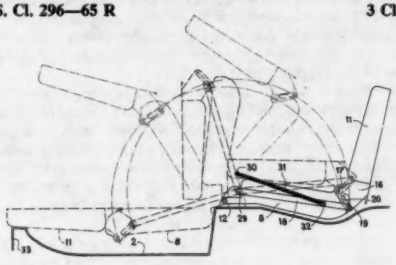
(d) locking means coupled to said door to permit access to said enclosure in a first mode when a driver enters said enclosure and an actuator coupled to said locking means to actuate the same from within said enclosure by exerting a unidirectional force to allow exit from said enclosure.

4,227,736

CONVERTIBLE SEAT FOR AUTOMOBILE VEHICLES

Jean-Claude Lebault, Guitrancourt, and Guy Rabouille, Courville, both of France, assignors to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Dec. 6, 1978, Ser. No. 966,955
Claims priority, application France, Dec. 9, 1977, 77 37199
Int. Cl.[3] B60N *1/02*
U.S. Cl. 296—65 R **3 Claims**



1. A seat structure comprising a seat proper, means for mounting a front part of the seat proper on the floor of a vehicle to pivot about a first transverse axis a backrest having a base part, lateral members mounting the base part of the backrest on the seat proper to pivot about a second transverse axis, at least one link which is connected adjacent a first end of the link to the base part of the backrest to pivot about a third transverse axis, means for connecting the link adjacent a second end of the link opposite said first end to the floor to pivot about a fourth transverse axis, the seat proper and the link forming two crossed arms of a device for deploying in the horizontal position the backrest relative to the seat proper upon a rotation of the seat proper through an angle of about 180° in a direction away from the backrest about said first axis,

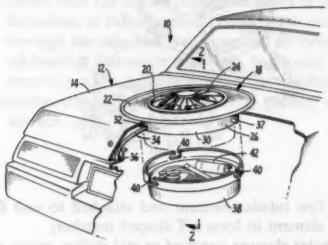
said third transverse axis being embodied by pins which are engaged in slots provided in said lateral members and hook members being respectively pivoted to the corresponding lateral members and being respectively engageable with the pins to hold the pins at one end of the slots, said hook members being part of a device for selectively immobilizing and releasing the pins relative to the slots.

4,227,737

AUTOMOTIVE TRUNK DECK LID ACCESSORY

Calvin R. Vogt, P.O. Box 94, Lafayette, Calif. 94549

Filed Nov. 13, 1978, Ser. No. 960,081
Int. Cl.³ B62D 25/10
U.S. Cl. 296—76 **3 Claims**



1. A decorative accessory for mounting upon an opening formed in the deck of the storage trunk lid of an automobile comprising

a central wheel hub overlying said opening and a connected tire cover mounted upon the deck;

a reservoir sealed to said opening for catching water passing through the central wheel hub;

conduit means draining the reservoir to the periphery of said lid; and

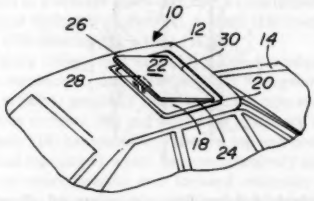
a casing removably depending from the reservoir to define a storage compartment between it and the reservoir.

4,227,738

SUNROOF FORWARD EDGE LATCH

Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.

Filed Oct. 10, 1978, Ser. No. 949,820
Int. Cl.² B60J 7/18
U.S. Cl. 296—224 **4 Claims**



1. A releasable latch for joining one edge of a sunroof panel to a section of frame extended about an opening in a vehicle roof comprising:

a rotatable cam member adjacent the underside of the frame having a first position wherein a cam projection abuts the frame and a second position wherein said projection is retracted;

a recessed member attached to the frame to nestingly receive said cam projection in its first position;

means for rotatably supporting the cam to the panel;

means for rotating the cam from its first position to its second position; and

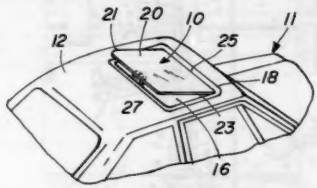
means for rotation of the panel about the joined edge.

4,227,739

SUNROOF OPENING AND LOCKING DEVICE

Norman L. Sorensen, Detroit, Mich., assignor to Wisco Corporation, Ferndale, Mich.

Filed Oct. 10, 1978, Ser. No. 950,030
Int. Cl.³ B60J 7/00
U.S. Cl. 296—224 **5 Claims**



1. A two-part separable fastener for joining one edge of a sunroof panel to a section of a frame extending about an opening in a vehicle roof comprising:

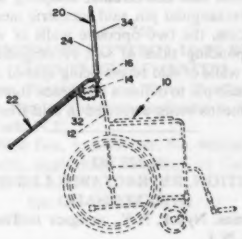
an arm having an over-center action pivotally supported to the underside of the panel adjacent an edge thereof, and a pivoting link pivoted at one end to an intermediate portion of the arm and releasably pivoted at the other end to a transversely actuated releasable latch supported by the frame.

4,227,740

ATTACHMENT FOR A WHEELCHAIR

Robert C. East, 2097 S. Devinney St., Lakewood, Colo. 80228

Filed Apr. 12, 1979, Ser. No. 29,454
Int. Cl.³ A47C 7/38
U.S. Cl. 297—310 **10 Claims**



1. An attachment for a wheelchair having rearwardly extending spaced handles adapted to be grasped by a person pushing the chair comprising frame means, connectable to the handles of a wheelchair to secure the frame means thereto and including a chair supporting frame portion and an integrally connected head supporting frame portion extending at an obtuse angle relative to said chair supporting frame portion, head support means secured to said head support frame portion for engaging and supporting the head of an occupant of the wheelchair and floor engaging means on said chair supporting frame portion for supporting the wheelchair when the chair is tilted backwards.

4,227,741

BACKLASH FREE SEAT ADJUSTER

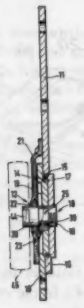
Josef Gross, Rockenhausen; Heinz Werner, Remscheid-Hasten; Volker Schmidt, Rockenhausen, and Heinz P. Cremer, Remscheid, all of Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid-Hasten, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,540

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2757907

Int. Cl.[2] A47C *1/025;* F16H *55/18*

U.S. Cl. 297—362 10 Claims



1. In an articulated mounting for seats having angularly adjustable backrest, particularly for use in motor vehicle seats, including a stationary hinge part assigned to the seat and a reclinable hinge part assigned to the backrest, a pivot axle for connecting the hinge parts, and an angular position adjuster and arrester in the form of wobble gears including an inner gear connected to one hinge part and being rotatable about said pivot axle, an outer gear connected to the other hinge part and being rotatable about an eccentric member coupled for rotation with the pivot axle, a combination according to a non-circular coupling section on said pivot axle; said eccentric member being a separate piece having an eccentric recess, two opposite walls of said recess slidably engaging corresponding sides of said non-circular coupling section to permit radial displacement of the eccentric member on said coupling section; means for adjusting and arresting the eccentric position of said eccentric member relative to said coupling section of said pivot axle; and wherein said non-circular coupling section of said pivot axle is a rectangular pin, said eccentric member having a rectangular recess, the two opposite walls of which slidably engage corresponding sides of said rectangular pin and the other opposite walls of said recess being spaced apart from the facing sides of said pin to define a free space therebetween, and said adjusting means being arranged in said free space.

4,227,742

MULTI-POSITION, RETRACTABLE LEG REST FOR A WHEELCHAIR

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Filed Jan. 30, 1979, Ser. No. 7,678

Int. Cl.[2] A47C *7/50*

U.S. Cl. 297—430 8 Claims

1. A multi-position leg rest apparatus for use on a wheelchair of the type having a footrest and a footrest frame, said apparatus comprising:

a leg rest cushion having a front edge and a rear edge;

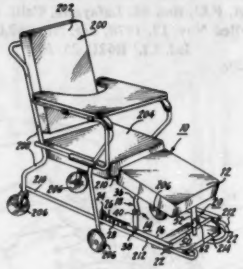
a sliding means slidably attached to said footrest frame;

a first cushion height adjustment means attached to said sliding means for selectively raising the rear edge of said cushion to an elevated position and for lowering the rear edge of said cushion to a storable position; and,

a second cushion height adjustment means attached to said sliding means for selectively locating the front edge of said cushion at one of three separate vertical height adjustments corresponding respectively to a lowest first position, an intermediate second position and an upper third position, said second height adjustment means further including:

a first horizontally disposed tubular element rotatably attached to the underside of said cushion;

a second tubular element, vertically oriented with respect



to said first tubular element and attached to said first tubular element to form a T-shaped member;

a third tubular element attached to said sliding means and telescopically received within said second tubular element; and,

a pushbutton means attached to said second tubular element for engaging said second height adjustment means in at least one of said three positions,

wherein the vertical height of the front and rear edge of the leg rest cushion can be independently and selectively adjusted.

4,227,743

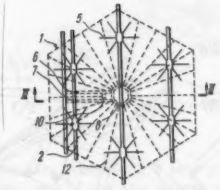
METHOD OF THERMAL-MINE RECOVERY OF OIL AND FLUENT BITUMENS

Leonid M. Ruzin, poselok Yarega, ulitsa Kosmonavtov 5, kv. 26; Jury A. Spiridonov, ulitsa Chibjusskaya, 7, kv. 81.; Gennady S. Chuprov, prospekt Lenina, 37/10, kv. 72.; Boris A. Tjunkin, ulitsa Oplesnina, 30, kv. 33., all of Komi ASSR, Ukhta, and Vladimir P. Tabakov, ulitsa Soffii Kovalevskoi, 4-a, kv. 125., Moscow, all of U.S.S.R.

Filed Sep. 15, 1978, Ser. No. 943,558

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—2 25 Claims



1. A method of thermal-mine recovery of oil and fluent bitumens, which comprises

providing a system of mine working overlying an oilbearing formation;

drilling from said mine working and from the ground surface a plurality of injection wells adapted for charging a pressurized fluid therethrough into the oil-bearing formation; providing a slope and a man way in the area of the oil-bearing formation, where the provision of a recovery gallery is envisaged; providing the recovery gallery in this area of the oil-bearing formation;

drilling from said recovery gallery a system of horizontal and inclined oil recovery wells which are separate from the injection wells;

charging a heat carrier into the recovery wells extending substantially across the dominating direction of the highly permeable zones of the oil-bearing formation, for uniform distribution thereof throughout the volume of the oil-bearing formation and for heating the latter to a temperature at which the oil acquires sufficient fluidity within the oil-bearing formation;

terminating the charging of the heat-carrier into said recovery walls upon the oil-bearing formation having attained the said temperature;

charging a pressurized fluid into the injection wells which are separate from the recovery wells and minimally associated with the highly permeable zones of the oil-bearing formation, to thereby directly supply the pressurized fluid through the injection wells into and to force oil from the oil-bearing formation into said horizontal and inclined recovery wells, toward said recovery gallery; and

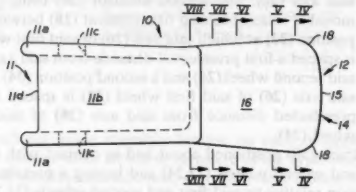
withdrawing oil from said recovery gallery to the ground surface.

4,227,744

IMPACT TIP FOR IMPACT ROCK BREAKER

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 29, 1979, Ser. No. 11,600
Int. Cl.[2] A01B *23/02*; E21C *35/18*
U.S. Cl. 299—94 **9 Claims**



1. In a detachable impact tip (10) for an impact rock breaker (B) which includes a mounting socket (11) adapted for fixed attachment to a breaker shank (B1, and a rock impacting tooth (12) integral with said socket (11), a tooth (12) comprising:

a base (13) abutting the socket (11);

and a body (14) on said base (13) which is wedgeshaped in side elevation so that it has generally triangular sides 14*a*, and which is generally spade-shaped in plan with top and bottom surfaces (16) and a forward extremity (15),

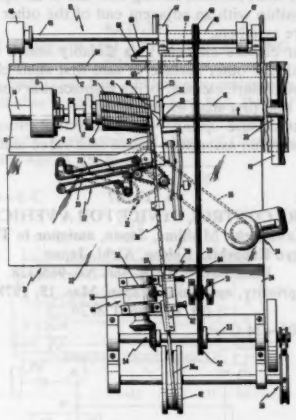
said body (14) has smoothly rounded top and bottom longitudinal margins 17 which have progressively smaller radii of curvature toward said forward extremity (15), said generally triangular sides (14*a*) of the body (14) merge progressively into said smoothly rounded top and bottom longitudinal margins (17) toward said forward extremity (15) and vanish rearwardly thereof, said forward extremity (15) forms a blunt edge smoothly rounded from top to bottom, and smoothly curved forward margins (18) between said longitudinal margins (17) and said extremity (15), and said body (14) is devoid of any abrupt transitions from one area to another except between the top and bottom surfaces (16) at and immediately adjacent the forward extremity (15).

4,227,745

APPARATUS FOR AND METHOD OF MAKING BRUSHES

Harvard W. K. Enchelmaier, 4 E. Greenbrook Rd., North Caldwell, N.J. 07006

Division of Ser. No. 724,410, Sep. 17, 1976, Pat. No. 4,114,221.
This application Jun. 1, 1978, Ser. No. 911,305
Int. Cl.[2] A46D *3/04*
U.S. Cl. 300—2 **17 Claims**



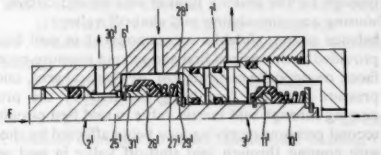
1. A machine for making brushes, comprising: a brush core rotating element, means for driving said element, a support mounted closely adjacent to the brush core, the brush core and support being mounted for movement relative to each other along a path parallel to the axis of the core, means mounted on the support for feeding a strip having a side edge toward the core, for guiding the strip, and for positioning the strip for winding in a helix on the core by rotation of the core, means on the support positioned along the path of feeding of the strip to the core progressively to notch said side edge of the strip and to form tabs on the strip at spaced locations therealong which are directed radially inwardly of the brush core, and means to feed bristles to the notched edge of the strip as it is fed onto the core.

4,227,746

BRAKING PRESSURE CONTROL UNIT FOR A DUAL CIRCUIT BRAKE SYSTEM

Bernd Schopper, Frankfurt, and Peter Tandler, Falkenstein, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,661
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1977, 2753948; Dec. 3, 1977, 2753949
Int. Cl.[3] B60T *8/26*, *11/10*
U.S. Cl. 303—6 R **17 Claims**



1. A braking pressure control unit for a dual-circuit brake system comprising:

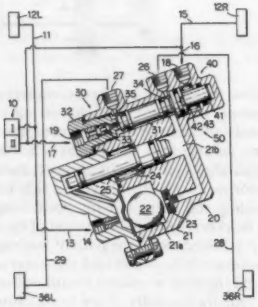
a housing accommodating therein two coaxial valve chambers disposed in tandem with respect to each other;
a valve seat disposed in each of said valve chambers; and
a closure member disposed in each of said valve chambers in an opening and closing relationship with an associated one of said valve seats, each of said closure members, in the rest position, being held in a spaced relationship with its associated one of said seats by a control force;
at least one of said closure members includes.
a first shaft element having one end in an operative relationship with an adjacent end of the other of said closure members,
a first closure element in a slidably sealed relationship with the outer surface of said first shaft element, said first closure element being displaceable between limits on said first shaft element, and
a first closure spring biasing said first closure element toward an associated one of said valve seats.

4,227,747

PRESSURE CONTROL DEVICE FOR A VEHICLE BRAKE

Hiroshi Kawaguchi, Mishima, Japan, assignor to Toyota Kidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 4, 1978, Ser. No. 966,328
Claims priority, application Japan, Mar. 15, 1978, 53-29632
Int. Cl.[2] B60T *8/26*
U.S. Cl. 303—24 C **10 Claims**



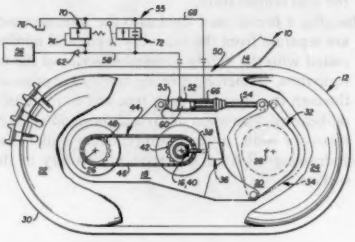
1. A pressure control device for a dual type vehicle brake system having a pair of first and second circuits mutually independent for delivering the braking fluid pressure produced in a master cylinder, which is provided with a pair of pressure chambers, to each wheel cylinder disposed respectively on a pair of right and left rear wheels, said pressure control device for controlling the pressure rising in each of said rear wheel cylinders, when the deceleration rate of the vehicle exceeds a predetermined value, comprising:
an inertia valve, installed in said first circuit, provided with an inertia body which is allowed to shift, resisting the biasing force, to close a passage for the braking fluid when the deceleration rate of the vehicle exceeds a predetermined value;
a shut-off valve installed in said second circuit for closing a passage for the braking fluid in said second circuit;
a housing accommodating said shut-off valve;
a balance piston, slidably accommodated in said housing, provided with a pair of first and second pressure-receiving faces, on opposite ends thereof, of identical area, said first pressure-receiving face being affected by the pressure coming through said inertia valve in said first circuit, said second pressure-receiving face being affected by the pressure coming through said shut-off valve in said second circuit, said balance piston being operated by the pressure difference between the pressure acting on said first and second pressure-receiving faces, for opening said shut-off valve when the pressure in said first circuit is higher, and for closing said shut-off valve when the pressure is said second circuit is higher.

4,227,748

TRACK TENSIONING APPARATUS

Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 909,759, May 26, 1978, abandoned. This application Nov. 9, 1979, Ser. No. 92,915
Int. Cl.[3] B22D *55/30*
U.S. Cl. 305—10 **6 Claims**



1. A work vehicle (10) comprising:
a frame (14) having an axis (16);
a first element (18) having a first wheel (22) and being connected to said frame (14) and pivotally movable relative to said frame (14) about said axis (16) of said frame (14), said first wheel (22) having an axis (26) and being rotatable about said axis (26);
a second element (20) having a second wheel (24) and being pivotally connected to said first element (18), said second wheel (24) having an axis (28) and being rotatable about said axis (28), said second element (20) being pivotally movable relative to said first element (18) between a first position (32) at which said axis (26) of said first wheel (22) is spaced a first preselected distance from said axis (28) of said second wheel (24) and a second position (34) at which said axis (26) of said first wheel (22) is spaced a second preselected distance from said axis (28) of said second wheel (24);
a track (30) positioned about and in contact with said first and second wheels (22,24) and having a preselected tension relative to said first and second wheels (22,24);
power means (36) for rotating said first wheel (22) for driving said track (30); and
means (50) for controllably pivotably moving said second element (20) relative to said first wheel (24) for controllably maintaining a preselected tension in said track (30) relative to said first and second wheels (22,24).

4,227,749

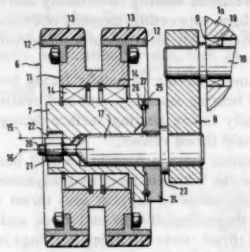
TRACK TENSIONING APPARATUS AND METHOD FOR TRACK-TYPE VEHICLES

Hans G. Hesse, Munich, Fed. Rep. of Germany, assignor to CON-TECHNIK GmbH, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,448
Claims priority, application Fed. Rep. of Germany, May 18, 1977, 2722457
Int. Cl.[2] B62D *55/30*
U.S. Cl. 305—30 **11 Claims**

1. Track tensioning apparatus for track type vehicles having a track, a track frame, and an idler wheel engageable with said track, said track tensioning apparatus comprising:
bearing means rotatably mounting said idler wheel to rotate about an idler wheel axis, said bearing means comprising a bearing pin having an eccentric bore whose axis is spaced from and parallel to said idler wheel axis;
support means including a support journal received by said

eccentric bore of said bearing pin for supporting said bearing pin to selectively pivot about the axis of said support journal; and



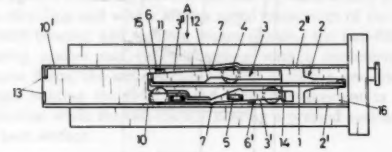
adjustable lock means for adjustably locking said bearing pin with said support journal so that said idler wheel axis is in a predetermined angular position with respect to the axis of said support journal.

4,227,750

PULL-OUT GUIDE FOR DRAWERS

Erich Röck, Höchst, and Bernhard Mages, Dornbirn, both of Fed. Rep. of Germany, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 31, 1978, Ser. No. 956,998
Claims priority, application Austria, Nov. 17, 1977, 8203/77
Int. Cl.³ F16C *29/04*; A47B *88/04*
U.S. Cl. 308—3.8 **13 Claims**



1. A pull-out guide assembly for use on each of opposite sides of a drawer in an article of furniture of the type wherein a drawer is slidably insertable into and removable from a furniture body, said pull-out guide assembly comprising:

a supporting rail and a pull-out rail adapted to be mounted on adjacent sides of the body and the drawer at positions to extend substantially horizontally and to be relatively longitudinally movable when the drawer is pushed into or pulled out from the body, said supporting rail and pull-out rail having respective vertically spaced and horizontally extending flanges;

at least two roller means, positioned for rolling contact on said horizontally extending flanges, for taking up vertical forces between said pull-out rail and said supporting rail when the drawer is positioned within the body;

said roller means being mounted within and supported by a carriage which is longitudinally movable with respect to said supporting and pull-out rails, said carriage comprising a single rigid and inflexible member extending longitudinally of said supporting and pull-out rails, said carriage and said rails being dimensioned such that said carriage is unitarily and completely tiltable in a single direction with respect to said rails about a horizontal axis transverse to the longitudinal direction of said rails only when said supporting rail and said pull-out rail are relatively longitudinally moved to a maximum drawer pull-out position;

plural locking means staggered in said longitudinal direction for locking said carriage in one of said rails when said rails are moved to said maximum drawer pull-out position, each said locking means comprising a projection and aperture provided on said carriage and said one rail in relative positions such that said projection extends into said aperture when said carriage is tilted about said axis; and

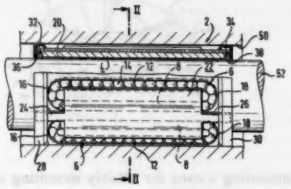
said one rail having at an inner end thereof, with respect to the direction of movement of the drawer, stop means for limiting the relative longitudinal movement between said carriage and said one rail.

4,227,751

BALL BUSHING WITH AXIAL EXTENDING BALL GUIDES

Ernst Albert, Sand, Fed. Rep. of Germany, assignor to Deutsche Star Kugelhalter GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,855
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1978, 2803615; Apr. 6, 1978, 2814917
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **24 Claims**



1. Ball bushing arrangement for an axially elongated ball guide for shafts and the like comprising a housing having an axially elongated bore therethrough, an axially elongated tubular shaped cage positioned within said housing bore and having a plurality of endless ball loops therein extending in the axial direction of the cage, said cage having a radially inner surface and a radially outer surface, said ball loops spaced circumferentially apart around said cage and each containing a plurality of balls, each said loop having a first ball duct for a row of loaded balls and a second ball duct for a row of unloaded balls, each first ball duct being open through the radially inner and radially outer surfaces of said cage, each said ball loop arranged with said first ball duct therein adjacent to said first ball duct in the adjacent said ball loop along one axially extending side and said second ball duct therein adjacent to said second ball duct in the adjacent said ball loop along the other axially extending side, a joint race insert extending in the axial direction of said race along the radially outer surface and covering two adjacent said first ball ducts, wherein the improvement comprises that each said joint race insert is formed of a thin wall material which is elastic with respect to bending forces and is unyielding in the thickness direction thereof, said joint race insert being displaceable by said balls in said first ball ducts radially outwardly against the surface of said housing bore laterally enclosing said ball bushing.

4,227,752

STAGED BEARING SURFACE COMPLIANCE FOR HYDRODYNAMIC FLUID BEARING

Donald F. Wilcock, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,258
Int. Cl.³ F16C *17/06, 32/06*
U.S. Cl. 308—9 **11 Claims**

1. A resilient compliant hydrodynamic fluid bearing, comprising:

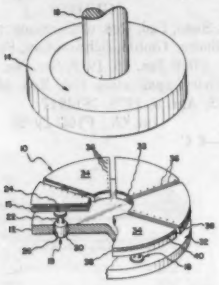
a stationary member and a relatively movable member, said members defining therebetween a gap;

a plurality of pads supported by said stationary member for

tilting about axes parallel to the plane of said stationary member;

each of said pads having a compliant bearing layer in opposed relationship to an opposing bearing surface on said movable member;

said compliant bearing layer including a thin, flexible bearing sheet having a bearing surface on one side thereof facing said opposing bearing surface, and a resilient, compliant supporting structure underlying said bearing sheet on the other side thereof for resiliently supporting said bearing sheet while permitting local deflections thereof; and



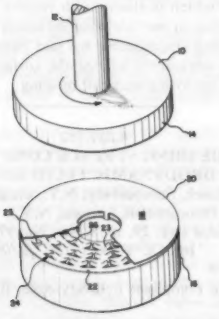
flexure mounting means for tiltably mounting said pads on said stationary member to enable said pads to conform to large scale changes in the slope of said opposing bearing surface and to automatically maintain the correct large scale orientation of said bearing sheet while said compliant bearing layer resiliently deflects to respond to hydrodynamic fluid forces existing between said bearing surfaces to cause said bearing sheet to assume a profile that is conducive to the establishment and maintenance of supporting hydrodynamic fluid films between said bearing surface, said flexure having an angular stiffness greater than one tenth of the angular stiffness of said compliant supporting structure.

4,227,753

COMPLIANT GAS THRUST BEARING WITH PROFILED AND APERTURED THRUST RUNNER

Donald F. Wilcock, Schenectady, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,260
Int. Cl.³ F16C *19/00*
U.S. Cl. 308—09 **24 Claims**



1. A compliant fluid thrust bearing, comprising:

a thrust plate and a relatively movable thrust runner, defining therebetween a gap for receiving a compliant bearing assembly;

a compliant bearing assembly disposed within said gap and including a flexible bearing sheet facing said thrust runner, and a resilient supporting element operatively engaged with said thrust plate for resiliently supporting said bearng sheet;

said thrust runner having an axially facing bearing surface facing said bearing assembly, and said bearing sheet having an axially facing bearing surface facing the bearing surface at said thrust runner;

said thrust runner having formed on said bearing surface thereof a profile which induces hydrodynamic supporting fluid pressure areas to support said thrust runner upon movement thereof relative to said sheet; and

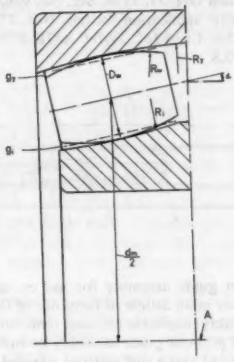
means in said thrust runner defining openings in the bearing surface thereof for admitting externally pressurized fluid for cooling and hydrostatic purposes.

4,227,754

ROLLING BEARING

Magnus Kellström, Partille, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Filed Mar. 26, 1979, Ser. No. 23,625
Claims priority, application Sweden, Apr. 11, 1978, 7804017
Int. Cl.³ F16C *19/26, 33/58*
U.S. Cl. 308—177 **2 Claims**



1. A rolling bearing incorporating outer race ring, inner race ring, race tracks arranged therein and rolling bodies rolling in said race tracks, wherein at least one of the axial section profiles of the race tracks and rolling bodies in the common contact positions between rolling body and race track is curved, so that the bearing osculation ratio g_i/g_y wherein g_i and g_y are the spaces between the envelope surface of the rolling body and the race track of the inner race ring and the outer race ring respectively taken along a normal to the rolling body axis located at a distance from the rolling body centre of a non-loaded bearing, is greater than

$$0.5 + 0.5\left[\frac{1+\gamma}{1-\gamma}\right]^{1.5}$$

in which

$\gamma = D_w \cos \alpha / d_m$ and

D_w = the rolling body diameter,

α = the bearing contact angle and

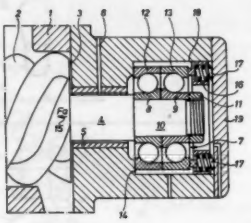
d_m = twice the distance between the rolling body centre and the bearing axis.

4,227,755

BEARING ARRANGEMENT FOR SHAFT OF ROTARY COMPRESSOR

Anders Lundberg, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Oct. 19, 1978, Ser. No. 952,795
Claims priority, application Sweden, Oct. 24, 1977, 7711928
Int. Cl.[3] F16C *27/04*
U.S. Cl. 308—184 R 7 Claims



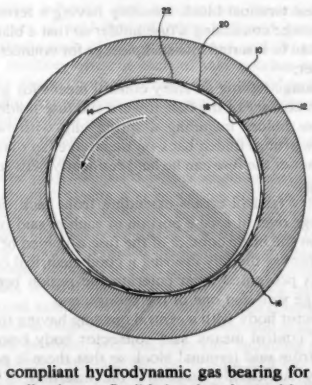
1. In a rotary compressor, the combination of a housing, a rotor mounted in the housing and having a shaft, the rotor and shaft being subjected to an axial force in one direction while the compressor is loaded and tending to move axially in the opposite direction when the compressor is unloaded, a slide bearing in which the shaft is journalled in the housing with a clearance radially of the shaft, an anti-friction bearing mounted on the shaft and journalled to the shaft to hold the shaft against axial displacement in either direction with respect to said anti-friction bearing, the housing having a fixed support surface against which the anti-friction bearing abuts axially in said one direction and which allows radial movement of the anti-friction bearing, and yielding means pressing the anti-friction bearing against said support surface with a predetermined precise force, the anti-friction bearing including anti-friction means holding the shaft against axial displacement in both directions while the anti-friction bearing is pressed against said support surface.

4,227,756

HIGH TEMPERATURE LOW FRICTION SURFACE COATING

Bharat Bhushan, Watervliet, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,264
Int. Cl.[2] F16C *17/00, 33/00*
U.S. Cl. 308—241 4 Claims



1. In a compliant hydrodynamic gas bearing for high temperature applications, a flexible bearing sheet with one bearing surface, and a relatively rotating rigid member with an opposing bearing surface, the improvement comprising:

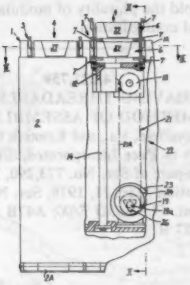
a flexible coating of less than 12 microns thickness on the bearing surface of the flexible bearing sheet, including a layer of CdO and graphite in proportions of about 1:3 by weight, dispersed in a fused matrix of 28%–32% by weight sodium silicate.

4,227,757

SAFE FOR STORAGE OF PAPER MONEY AND OTHER VALUABLES

Werner Ringe, Geesthacht, and Harry David, Hamburg, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 6,218
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1978, 2805252
Int. Cl.[3] E05G *1/00*; B65G *19/00*
U.S. Cl. 312—97 21 Claims



1. A safe for storage of paper money or other valuables, comprising a housing having a first opening and at least one additional opening; a first indexible conveyor mounted in said housing and including a plurality of receptacles for storage of valuables therein, one of said receptacles being accessible via said first opening during each interval of dwell of said conveyor between successive indexing movements thereof; means for indexing said conveyor at the will of the operator, including operator-actuated means for starting said conveyor; means for blocking the indexing movements of said conveyor; time-delay means for deactivating said blocking means with a preselected delay following the actuation of said means; an additional conveyor having a plurality of additional receptacles and being indexible to place a different additional receptacle into register with said additional opening upon termination of each indexing movement of said additional conveyor; means for indexing said additional conveyor, including operator-actuated means for starting said additional conveyor; means for blocking the indexing movements of said additional conveyor; and time-delay means for deactivating said last mentioned blocking means with a preselected delay following the activation of said last mentioned starting means.

4,227,758

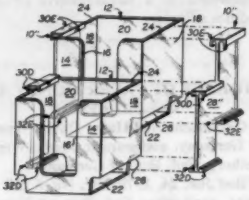
CONNECTORS FOR HOLDING TOGETHER MODULAR ARTICLES

George M. Clare, 299 Hartshorn Dr., Short Hills, N.J. 07078

Filed Apr. 20, 1978, Ser. No. 897,960
Int. Cl.[2] F16B *12/00*; A47F *3/14*
U.S. Cl. 312—107 12 Claims

1. A connector for holding together a plurality of modular articles each of the type having a pair of spaced apart upper and lower edge portions, said connector comprising an elongated flexible web member and a plurality of retainer members connected to said web member for support thereby, each of

said retainer members including a pair of oppositely facing channels for each of the modular articles to be held together, each channel receiving and retaining a respective edge portion of said pair of upper and lower edge portions, said web member having sufficient flexibility to permit one of the channels of said pair of channels to deflect to snap over the associated edge portion of a modular article, and said retainer members being positioned to hold the plurality of modular articles together in a predetermined configuration.



4,227,759

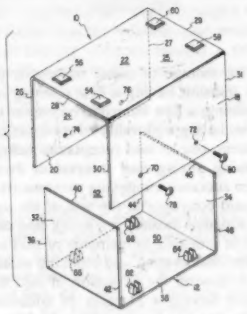
CONTAINER HAVING THREADABLE CLIP MEMBERS AND METHOD OF ASSEMBLING SAME

Walter Lee, Springfield, Va., and Kenneth C. Litt, Silver Spring, Md., assignors to Pace Incorporated, Silver Spring, Md.

Continuation-in-part of Ser. No. 773,290, Mar. 10, 1977. This application Mar. 21, 1978, Ser. No. 888,768

Int. Cl.[2] B65D *7/00;* **A47B** *43/00*

U.S. Cl. 312—257 R **5 Claims**



1. A container comprising two channel-like members which mate with one another to form an enclosure and a plurality of threadable clip members attached to the channel-like members, each threadable clip members having a threadable slot where (a) the slots of certain ones of the clip members respectively receive predetermined edges of the channel-like members and (b) screws or the like may be threaded in the slots of the remaining ones of the threadable clip members, the screws extending through holes provided in the channel-like members to thereby secure the latter members together.

4,227,760

LAMP SOCKET STRUCTURE

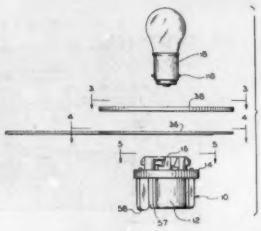
Roman J. Witek, Jr., Gibraltar, Mich., assignor to International Telephone and Telegraph Corporation

Filed May 11, 1979, Ser. No. 38,063

Int. Cl.[3] H01R *4/66*

U.S. Cl. 339—14 R **8 Claims**

1. A lamp socket comprising a cup-shaped socket open at one end thereof, a tubular wall extending from said one end to form a cavity in said socket for receiving a bayonet-type bulb, an annular platform extending outwardly from said wall, said platform terminating in an upturned rim flange, a conductive ring within said cavity adjacent the wall thereof for conductive grounding contact with a bulb ferrule, said ring including spaced terminal portions arrayed in said annular platform, spaced openings in said tubular wall in communication with said platform for receiving respective bulb contacting members, each said last-mentioned member including an inwardly directed portion for compressively engaging a lamp contact, an intermediate contact member portion extending through the wall opening to a terminal portion in said platform, said terminal portions being spaced midway between the terminal portions of said ring, each said terminal portion including a spring contact or lanced therefrom angled above the rim flange equally spaced about said platform.



4,227,761

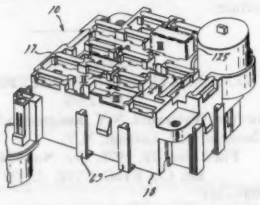
FUSE HOLDER WITH ENTRY CONTROL

Thomas M. Cairns, Birmingham; John H. Dewar, Grosse Ile, and Emmons F. Sumner, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 1, 1979, Ser. No. 16,468

Int. Cl.[3] H01R *13/631*

U.S. Cl. 339—66 M **3 Claims**



1. A fuse terminal block assembly having a terminal block with a passage containing a fuse holder so that a blade contact of a fuse can be inserted into said passage for connection to said fuse holder;

said passage having an entry control means for guiding the blade contact of the fuse toward the fuse holder;

said fuse holder including a spring clip with two mirror image prongs folded back on themselves so that the blade contact of the fuse can be held resiliently between the two prongs;

said entry control means extending from each side of said passage over at least a portion of each of said two prongs so that the blade contact of the fuse is guided between the two prongs thereby insuring a good electrical connection and is prevented from entering the region between the passage wall and one of the prongs; and

a connector body with a central opening having therein said entry control means, said connector body being removable from said terminal block so that there is provided a cavity sufficiently large for the insertion of a circuit breaker with blade contacts reaching the same contact

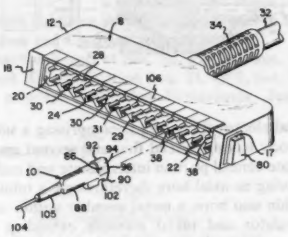
points in said fuse holder as a fuse which is associated with said entry control means in said connector body.

4,227,762

ELECTRICAL CONNECTOR ASSEMBLY WITH LATCHING BAR

Jack F. Scheiner, Litchfield, N.H., assignor to Vaughn Corporation, Salisbury, Mass.

Filed Jul. 30, 1979, Ser. No. 61,981
Int. Cl.[3] H01R *13/62*
U.S. Cl. 339—91 R **16 Claims**



1. An electrical connector assembly comprising, in combination:

a main terminal connector associated with a master cable comprising

(1) a housing having a receiving end, said receiving end defining an elongated opening exposing a cavity having a first plurality of grooves each of a first predetermined cross-sectional shape on one side of said cavity and a second like plurality of grooves each of a second cross-sectional shape, on the other side of said cavity, said first and second plurality of grooves opposing one another so as to form a like plurality of contiguous passageways from said opening to the back of said cavity;

(2) a plurality of terminal pins supported with respect to said housing, each of said pins being electrically connectable to said master cable, said pins being associated in pairs, the two pins of each pair being disposed in a spaced-apart relationship in a corresponding one of said passageways;

(3) a slot formed in said housing on said one side of said cavity transverse to said first plurality of grooves;

(4) an elongated locking bar having formed along its length thereof a plurality of spaced-apart notches, each notch being associated with a corresponding one of said grooves of said first plurality, said bar being mounted within said slot for movement between (a) a locking position wherein said notches are spaced from the grooves of said first plurality and said bar partially obstructs each of said passageways, and (b) an unlocking position wherein each of said notches is substantially aligned with a corresponding one of said grooves of said first plurality so that each of said passageways is substantially unobstructed; and

(5) biasing means for biasing said locking bar in said locking position; and

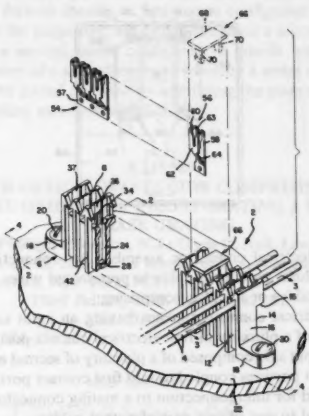
at least one plug associated with a single cable including an insertion end having a cross-section so as to be slidably receivable in a snug-fitting manner in any one of said passageways to a fully inserted position, said plug comprising a pair of terminal openings in said insertion end, and means disposed in each opening and electrically-connectable to said single cable, for receiving and making electrical contact with the corresponding terminal pins disposed in said one passageway when said plug is in said inserted position, said insertion end including (a) means cooperative with said bar for moving said bar from said locking position to said unlocking position against said biasing means when said plug is slid in said passageway to said inserted position, and (b) locking means cooperating with said locking bar when said plug is in said inserted position and said locking bar is in said locking position, for locking said plug in said passageway.

4,227,763

COMMONING CONNECTOR

Richard L. Marks, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 895,173, Apr. 10, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 28,479
Int. Cl.[3] H01R *4/24, 11/20*
U.S. Cl. 339—99 R **5 Claims**



1. An electrical connector for commonly connecting a variable number of electrical conductors in at least two separate groupings, said connector comprising:

an insulating housing having a wire-receiving face, a base, parallel sidewalls and parallel endwalls extending between said wire-receiving face and said base,

a plurality of parallel side-by-side terminal-receiving cavities extending into said wire-receiving face, said cavities being arranged in a single row which extends between said endwalls, adjacent cavities in said row being separated by parallel spaced-apart barrier walls which extend between said sidewalls, each of said barrier walls having a carrier strip-receiving slot therein extending from said wire-receiving face to said base,

at least two strips of terminal devices in said housing, each of said strips comprising at least two independent spaced-apart terminals extending from an integral carrier strip, said terminals being disposed in at least two adjacent cavities in said housing with said carrier strip extending through said carrier strip-receiving slots in the barrier wall at a location adjacent to said base, each of said terminals comprising a first plate portion which is coplanar with, and which extends laterally from, said carrier strip, said first plate portion being reversely formed at said wire-receiving face to define a second plate portion which extends towards said carrier strip, said first and second plate portions having wire-receiving slots therein for reception of a wire, and

wire-admitting slots in each of said sidewalls, and wire-admitting slots being aligned with said wire-receiving slots in said terminals whereby,

wires can be commonly connected by locating said wires adjacent to said wire-receiving face with their axes extending normally of said sidewalls and in alignment with said wire-

admitting slots and said wire-receiving slots, and thereafter moving said wires laterally of their axes, into said wire-receiving slots of said terminals.

4,227,764

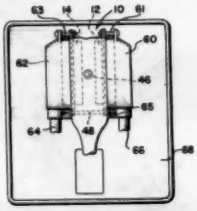
CONNECTOR AND ADAPTER SYSTEM

Earl D. Fiske, Excelsior Springs, Mo., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 798,781, May 20, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,479

Int. Cl.³ H01R *13/60, 25/06*

U.S. Cl. 339—121 **7 Claims**



1. An electrical connector assembly for connecting each wire of a plural wire input cable to preselected wires of a pair of output cables or the like, comprising:

first electrical connector means having an input side composed of a plurality of first electrical contact portions and an output side composed of a plurality of second electrical contact portions coupled to said first contact portions and adapted for interconnection to a mating connector means coupled to one of said pair of output cables;

second electrical connector means having an input side composed of a plurality of first electrical contact portions and an output side composed of a plurality of second electrical contact portions coupled to said first contact portions and adapted for interconnection to a mating connector means coupled to the other of said pair of output cables;

said input sides of first and second electrical connector means being spaced apart and oriented toward each other;

support means including a molded protective enclosure between said first and second electrical connector means about said input sides thereof to secure said first and second electrical connector means relative to each other in a predetermined physical relation;

conductor means for coupling each wire of said input cable to respective first contact portions of each of said first and second electrical connector means;

said molded protective enclosure providing a strain relief coupling of said wires of said input cable to said conductor means; fastening means for enabling securance of said connector to a mounting means, including a fastener-receiving aperture extending through said molded protective enclosure of said support means between said first and second electrical connector means;

mounting means comprising a mounting member having at least one threaded aperture for threadably receiving a fastener element disposed through said fastener-receiving aperture of said fastening means to thereby secure said connector assembly to said mounting member; and,

said mounting member having a predetermined array of individual punch-outs to facilitate securance of said mounting member to an electrical connector box having plural mounting points corresponding to at least selected ones of said array of individual punch-outs.

4,227,765

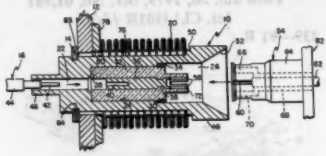
COAXIAL ELECTRICAL CONNECTOR

George J. Neumann, Bedford, and Barry Altschul, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 12, 1979, Ser. No. 11,618

Int. Cl.³ H01R *13/34*

U.S. Cl. 339—143 R **14 Claims**



1. A coaxial electrical connector comprising a substantially cylindrical body having spaced first and second end portions and an elongate central portion intermediate said end portions, said body having an axial bore therethrough, a tubular insulator fixed within said bore, a metal member within said insulator, said insulator and metal member extending coaxially within the bore and having ends shaped to interfit with electrical components to be mated therewith, a support member spaced from and encircling said first end portion of the body, a self-supporting, tubular, flexible, electrically conductive member spaced from and encircling said central portion of the body, said flexible member having one end fixed at, and electrically connected to, said support member and having its other end fixed and electrically connected to said second end portion of the body to support such body within the self-supporting tubular member, and means carried by said body for limiting travel of the body in a direction axially outward away from said support member.

4,227,766

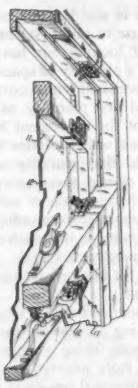
SECURITY METHOD AND SYSTEM

Santiago I. Finale, 94 E. 18th St., Paterson, N.J. 07524

Filed Jan. 30, 1979, Ser. No. 7,754

Int. Cl.³ G08B *13/08*

U.S. Cl. 339—147 R **10 Claims**



1. A system for interconnecting a plurality of security surfaces into a main alarm line, comprising:

(a) a strip of electrically conductive foil placed about the periphery of each of a plurality of security surfaces;

(b) a plurality of foil bridges, each of said bridges installed between adjacent, partially overlapping security surfaces, among said plurality of security surfaces, said overlapping

security surfaces being movable with respect to each other;

(c) a plurality of single circuit loops, each of said loops themselves comprising a combination of mutually connected conductives strips of individual security surfaces, a connection of these security surfaces occurring through said foil bridges; and

(d) a main alarm line having as an input thereto each of an output of said single circuit loops.

4,227,767

ELECTRICAL CONNECTOR FOR PRINTED CIRCUIT BOARDS

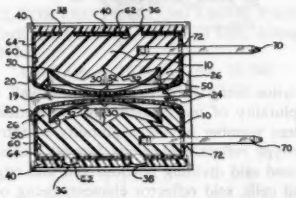
Bob Mouissie, Berlicum, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 919,738, Jun. 27, 1978, abandoned. This application Aug. 21, 1979, Ser. No. 68,350

Claims priority, application Netherlands, Jun. 30, 1977, 77268

Int. Cl.³ H01R *13/16*

U.S. Cl. 339—176 MF **9 Claims**



1. An electrical connector for a mating contact comprising a dielectric housing having a slot extending along the length thereof, at least one pair of opposed pairs of springs confined in said housing and flexible printed circuits covering said springs, said springs being restrained in an arcuately stressed condition and thereby being adapted to deflect and resiliently flex at their midpoints during insertion of a mating contact into said slot causing each spring to form a dual crested shape and thereby provide redundant pressure points between said flexible printed circuit and the mating contact.

4,227,768

MODULE FOR MOUNTING ELECTRICAL CONTACTS

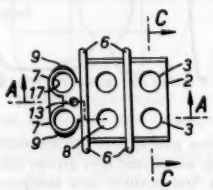
Antony B. Clewes, Sherwood, and Thomas W. Bowley, Bramcote, both of England, assignors to TRW Inc., Los Angeles, Calif.

Filed Jan. 11, 1979, Ser. No. 2,802

Claims priority, application United Kingdom, Jan. 12, 1978, 1298/78

Int. Cl.³ H01R *9/10, 9/22*

U.S. Cl. 339—198 H **5 Claims**



1. An electrical terminal module for interlocking with other similar modules to form an extendable terminal block, comprising:

an electrically insulating, generally rectangular terminal member with a top and bottom opposite each other and with first and second sides opposite each other, said top having a plurality of connector openings, each said opening for retaining an electrical connector device therein;

first and second barrier member projecting from said top adjacent said sides;

a male coupling member disposed on said first terminal side and extending outwardly therefrom, said male coupling member having a pair of laterally spaced, projecting, ear-like members with an outwardly extending lug member disposed on each said ear-like member, said projecting, ear-like members and said lugs configured such that a second module can be joined thereto; and

a female coupling member disposed on said second side and extending outwardly therefrom, said female coupling member having a base with a plurality of connector openings formed therein, a first recess configured to interfit with the projecting, ear-like members of a second module and a second recess configured to interfit with the lug member of a second module, whereby a series of modules can be joined together by interfitting the male and female coupling members together.

4,227,769

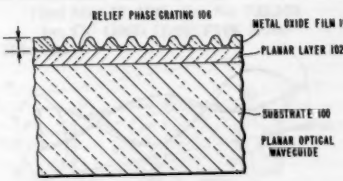
PLANAR OPTICAL WAVEGUIDE COMPRISING THIN METAL OXIDE FILM INCORPORATING A RELIEF PHASE GRATING

William Phillips, Princeton, N.J.; Clyde C. Neil, Levittown, Pa., and Jacob M. Hammer, Plainsboro, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,513

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.19 **6 Claims**



1. A planar optical waveguide comprising:

a substrate composed of a first dielectric material exhibiting a first index of refraction,

a planar layer composed of a second dielectric material exhibiting a second index of refraction greater than said first index of refraction said substrate supporting said planar layer,

a metal oxide film coating said planar layer, said metal oxide film exhibiting a third index of refraction greater than said second index of refraction, and

an optical-coupling relief phase grating incorporated on the exposed surface of said metal oxide film.

4,227,770

SUBMARINE FIBER OPTIC CABLE

Duncan A. Gunn, Great Dunmow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 22, 1978, Ser. No. 907,988

Claims priority, application United Kingdom, May 31, 1977, 22936/77

Int. Cl.³ G02B *5/16*

U.S. Cl. 350—96.23 **2 Claims**

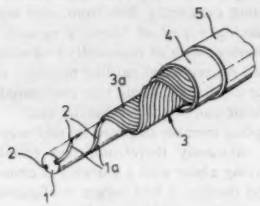
1. An optical fiber cable comprising:

a central strength member formed by a metallic wire having formed on its outer surface a plurality of helical grooves;

a single optical fiber laid in each of said grooves;

each optical fiber being enclosed in an electrically insulating material;

one or more layers of metallic wires wound helically over said fibers and said strength member, the direction of lay of all the wires of at least the layer of wires immediately



adjacent said optical fibers being opposite to that of said grooves and said fibers laid therein to avoid crushing of said fibers by said wires; and

a sheath surrounding said strength member and said optical fibers laid in said grooves thereon.

4,227,771

MONOLITHIC OPTICAL WAVEGUIDE HAVING A PLURALITY OF CORES

Daniel A. Nolan, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 840,242, Oct. 7, 1977, which is a continuation-in-part of Ser. No. 809,190, Jun. 23, 1977, abandoned. This application Feb. 21, 1979, Ser. No. 13,282

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.33 **1 Claim**

1. An elongate optical waveguide system having a longitudinal axis and adapted to support the propagation of electromagnetic signals along the length thereof, comprising:

a core member formed of a dielectric material having a first index of refraction and disposed in a helical locus about said axis;

a second core member formed of a dielectric material spaced in a helical locus about said axis substantially concentric with said first core member, said second core member being disposed radially outwardly of said first core member;

a cladding member formed of a dielectric material having an index of refraction less than the index of refraction of said core members and enveloping the helix defined by each core member.

4,227,772

PAVEMENT MARKER

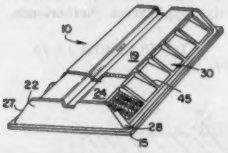
Sidney A. Heenan, Park Ridge, Ill., assignor to Amerace Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 681,859, Apr. 30, 1976, abandoned. This application Apr. 20, 1977, Ser. No. 789,265

Int. Cl.³ G02B *5/124*

U.S. Cl. 350—103 **17 Claims**

1. A low-profile pavement marker for providing a marking signal on a roadway surface capable of reflecting daylight falling thereon and for reflecting light back toward the source thereof so as to be visible to a driver in an oncoming vehicle, said pavement marker comprising: a substantially solid base of an opaque, light-diffusing synthetic resin having a generally horizontal bottom surface; said base having at least one support wall positioned in use in the direction of an oncoming vehicle, said wall having a plurality of inwardly extending recesses therein; a lens member of light-transmitting synthetic resin rigidly secured to said base, said lens member having a generally planar front face being so oriented as to make an acute angle of between about 15° and about 60° with said bottom surface to rise above the roadway surface upon which the pavement marker is to be installed; said lens member having a peripheral edge portion and a plurality of dividing portions intersecting said edge portion and dividing said lens member into a plurality of areas overlying and coextensive with said recesses formed in said support wall, said dividing portions and



said edge portion being sealed to said support wall, thereby to provide a plurality of independent and hermetically sealed cells; said lens member having a plurality of retroflective cube-corner-type reflector elements formed therein and extending beyond said dividing portions and said edge portion and into said cells, said reflector elements being oriented to reflect light falling upon said front face of said lens member in the areas thereof corresponding to said cells back toward the source thereof to render said reflector structure highly visible at night; said base, and said support wall and said lens member in the areas corresponding to said dividing portions and said edge portion providing a reflector surface for reflecting daylight falling upon said marker to render said marker highly visible in daylight.

4,227,773

OBJECTIVE LENS SYSTEM FOR MICROSCOPES

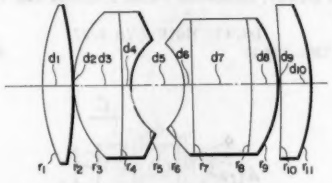
Tsutomu Tojo, and Toshifumi Uetake, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1978, Ser. No. 936,394

Claims priority, application Japan, Aug. 26, 1977, 52-102358

Int. Cl.³ G02B *9/34, 9/60*

U.S. Cl. 350—175 ML **11 Claims**



1. An objective lens system for microscopes comprising a front lens group and a rear lens group, said front lens group consisting of a first positive lens component and a second negative meniscus lens component having a concave surface on the image side, and said rear lens group comprising at least two lens components including a cemented three element component, said rear lens group comprising a third cemented meniscus lens component having a concave surface on the object side and a fourth positive lens component, and said objective lens system satisfying the following conditions:

$$0.12f < d/n < 0.2f \quad (1)$$

$$45 \leqq |\nu_p - \nu_n| + |\nu_n' - \nu_p'| \leqq 105 \quad (2)$$

$$0.8 < |r_6/r_5| < 1.1 \quad (3)$$

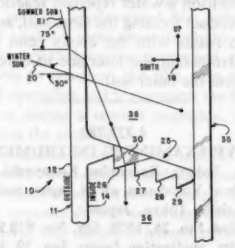
wherein the reference symbols r_5 and r_6 represent radii of curvature on the image side surface of the second lens component and the object side surface of the third lens component, the reference symbol $\Sigma d/n$ designates total sum of ratios between thicknesses and refractive indices of the respective lens elements of the third lens component, the reference symbols ν_p and ν_n denote Abbe's numbers of the first lens component and the negative element of the second lens component in the front lens group, the reference symbols ν_p, and ν_n, represent Abbe's numbers of the positive lens element and negative lens element of the third lens component in the rear lens group and the reference symbol f designates focal length of the entire lens system as a whole.

4,227,774

PANEL FOR CONTROLLING LIGHT PASSAGE

James A. Corll, #1 Westlake Dr., North East, Albuquerque, N. Mex. 87012

Filed Apr. 3, 1979, Ser. No. 26,740
Int. Cl.³ G02B *17/00, 27/00*
U.S. Cl. 350—263 **24 Claims**



1. A panel suitable for vertical disposition having light passing properties which vary with the angle of incidence of light upon it, comprising:

a first transparent element adapted for arrangement to receive incident upon it from first and second angles, said first angle being larger than said second angle from normal said transparent element,

a second transparent element, including a plurality of light refracting portions,

said second transparent element being carried by said first transparent element,

said plurality of light refracting portions being disposed to control the light from said first angle of incidence from passing said panel.

4,227,775

COLLOIDAL LIGHT VALVE HAVING ENHANCED IMAGE CONTRAST

George W. Goodrich, Bloomfield Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.

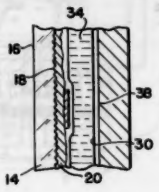
Filed Dec. 21, 1978, Ser. No. 972,138
Int. Cl.² G02F *1/17*
U.S. Cl. 350—267 **8 Claims**

1. A colloidal display having enhanced brightness comprising:

a diffusely transmissive window having a front and rear surface, said diffusely transmissive window having a set of electrically conductive transparent electrodes disposed along said rear surface in a predetermined pattern;

a rear substrate having a specularly reflective front surface and a rear surface;

a thin peripheral spacer disposed between the rear surface of said window and the front surface of said rear substrate forming an enclosed chamber between said window and rear substrate;



a colloidal suspension of dichroic dipole particles disposed in said chamber and filling the space between said window and rear substrate; and

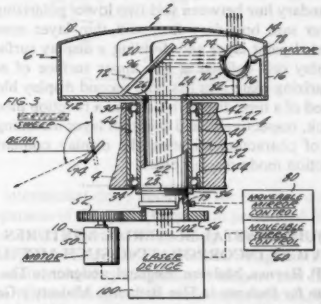
means for applying an electrical potential between the individual electrodes of said set of transparent electrodes and the specularly reflective surface of said rear substrate.

4,227,776

TURRET DEVICE

William A. Morton, North Palm Beach, and John I. Caporini, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 27, 1968, Ser. No. 733,223
Int. Cl.³ G05D *25/00*; F21K *27/00*
U.S. Cl. 350—285 **3 Claims**



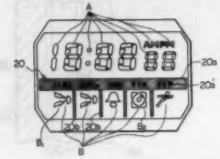
1. A turret device for directing a laser beam comprising, an enclosure having a cutout portion, support means for supporting said enclosure, an opening through said support means, said enclosure having a cylindrical member fixed thereto, said cylindrical member passing through said opening, said cylindrical member being mounted for rotation relative to said support means, a laser device for emitting a laser beam of high power and directing it into said cylindrical member and enclosure, means for rotating said enclosure, an optical system in said enclosure for directing said laser beam in said enclosure through said cutout portion, wherein said optical system includes a first reflecting surface located in line with said cylindrical member, and a second reflecting surface positioned to receive a reflective beam from said first reflecting surface, the second reflecting surface being pivotally mounted to provide for an angular range of output through said cutout.

4,227,777

LIQUID CRYSTAL DISPLAY CELL

Tomomi Murakami, Higashiyamato, Japan, assignor to Citizen Watch Company, Limited, Tokyo, Japan

Filed Jan. 31, 1978, Ser. No. 873,961
Claims priority, application Japan, Feb. 3, 1977, 52-11944
Int. Cl.[3] G02F 1/133
U.S. Cl. 350—334 3 Claims



1. A multicolor liquid crystal display cell comprising: a lower glass plate;

an upper glass plate stacked above and secured to said lower glass plate in spaced relationship with respect to one another;

an upper polarizing plate attached to said upper glass plate and covering a surface portion thereof;

at least two lower polarizing plates each of a different color and attached to said lower glass plate and covering different surface portions thereof; and

a thin layer of non-transparent material integrally formed on said upper polarizing plate at a position over and along a boundary line between said two lower polarizing plates to cover said boundary line, said thin layer comprising a printed paint layer and dividing a display surface of said display cell defined at the upper surface of said upper polarizing plate into first and second display blocks composed of a time display block and a function mode display block, respectively, and said thin layer including a plurality of characters idicating the display contents of said function mode display block.

4,227,778

LIQUID CRYSTAL MATERIAL MIXTURES AND DEVICES INCORPORATING SUCH MIXTURES

Edward P. Raynes, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Oct. 30, 1978, Ser. No. 955,751
Claims priority, application United Kingdom, Nov. 2, 1977, 45627/77
Int. Cl.[3] G02F 1/13; C09K 3/34
U.S. Cl. 350—350 R 11 Claims

1. A mixture of liquid crystal materials for use in liquid crystal displays comprising at least one material of type A and at least one material of type B selected so that the resultant mixture has only one liquid crystal phase between crystal and isotropic states and has the value $\Delta Vc/Vc$ less than 0.2 over a temperature range of 40° C., wherein

type A has the following phases with increasing temperature crystal working phase isotropic,

type B has the following phases with increasing temperature crystal working phase smectic working phase isotropic,

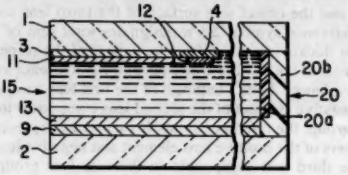
and the working phase is nematic or cholesteric.

4,227,779

HERMETIC SEAL FOR ELECTROCHROMIC DISPLAY

Saadi Bissar, and Douglas George, both of Waterbury, Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Apr. 9, 1979, Ser. No. 28,141
Int. Cl.[3] G02F 1/17
U.S. Cl. 350—357 16 Claims



1. In an electro-optic display having spaced substrates carrying electrode means, a hermetic sealant between portions of the substrates defining a cell therebetween and an electrolyte in the cell,

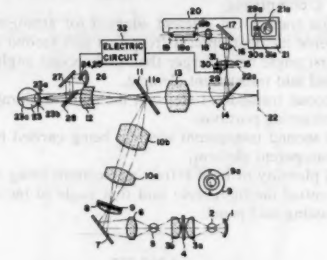
an improved hermetic sealant providing an inner seal chemically formed in situ at the interface with the electrolyte by reaction therewith and an outer seal surrounding the inner seal, said sealant comprising a mixture of epoxy resin and a curing agent which reacts with the electrolyte at the interface to form a water repellant reaction product, said reaction product forming the inner seal, and which curing agent also reacts with the epoxy resin at areas of the sealant surrounding the interface to cure said resin and thereby form the outer seal.

4,227,780

EYE EXAMINING INSTRUMENT

Shinichi Ohta, Tokyo; Kazunobu Kobayashi, and Haruhisa Madate, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1978, Ser. No. 918,923
Claims priority, application Japan, Jun. 29, 1977, 52-77449
Int. Cl.[2] A61B 3/14; G03B 29/00
U.S. Cl. 351—7 13 Claims



1. An eye examining instrument comprising:

an eye examining system provided with an objective optical means;

a signal generating source for generating elastic waves;

a wave projection system for converging the elastic waves to the cornea of the eye which is spaced a predetermined distance from said eye examining system and for directing in a predetermined direction the waves generated by said signal generating source;

detection means connected with said system for receiving said elastic waves and transforming them into an electric signal;

a wave receiving system for converging the elastic waves reflected upon the cornea of a human eye onto said detection means; and

an electric circuit for subjecting said electric signal to a predetermined processing.

4,227,781

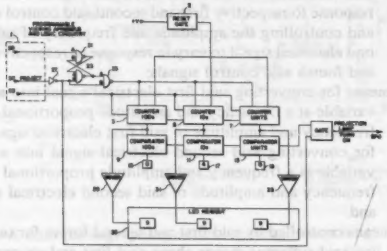
PROJECTION LAMP CONTROL

Herbert L. Hardy, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 26, 1979, Ser. No. 33,701

Int. Cl.³ G03B *21/32*

U.S. Cl. 352—41 **7 Claims**



1. In a cinematographic method of operating a film cassette having opposite ends of an elongated film strip affixed to a supply spool and a takeup spool respectively by operating the cassette through repeated cycles comprised of alternately rotating the spools to transport the film strip for projection during a forward operation and to transport the film strip in an opposite direction during a rewind operation, the improved method comprising the steps of:

sensing the revolutions of one of said spools;

responsive to each revolution of said one spool, incrementing a digital count in one direction during forward operations, in the opposite direction during rewind operations, and again in the one direction immediately at the end of rewind operations and prior to the start of an additional forward operation so that the position of the film strip is continuously measured with respect to said count; and

controlling the energization of a projection lamp during forward movement of said film strip depending upon whether the count is above or below a predetermined number so as to preclude projection of the end portion and to project image frames located on said film strip adjacent the end portion.

4,227,782

CARD MOTION PICTURE PROJECTION SYSTEM

Philip R. Norris, North Reading, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 11, 1979, Ser. No. 47,141

Int. Cl.³ G03B *41/00*

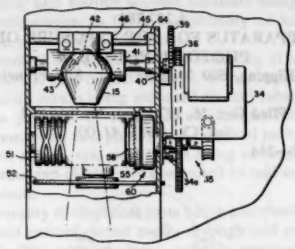
U.S. Cl. 352—82 **24 Claims**

1. Projection apparatus for use with at least one sheet of photographic film having images recorded thereon in a plurality of arcuate rows, said apparatus comprising:

means for supporting said film sheet for movement in a direction substantially normal to said arcuate rows and in a given film plane;

optical means for illuminating one of a row of images located at a projection location in said film plane and for directing light therefrom along a given optical path from said projection location to a viewing screen so as to project the image thereon;

means for mounting said optical means for movement of at least a portion thereof along an arcuate path generally laterally of said first direction so as to thereby illuminate and direct light from any image in said row of images; and



drive means for alternately moving said film in its said given direction and said portion of said optical means along its said arcuate path to thereby project one or more images from any of said plurality of arcuate image rows.

4,227,783

DEVICE FOR STOPPING OR FIXING MOVING OR MOBILE COMPONENTS

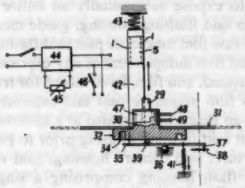
Josef Drasch; Gustav Firla, both of Vienna; Leopold Rollenitz, Totzenbach, and Robert Scheiber, Wiener Neudorf, all of Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jul. 27, 1978, Ser. No. 928,448

Claims priority, application Switzerland, Jul. 29, 1977, 009413/77

Int. Cl.³ G03B *1/22*

U.S. Cl. 352—194 **9 Claims**



1. In an intermittent drive apparatus for use in a cinematographic apparatus of the type for use with perforated film, said intermittent drive apparatus comprising: cam means for controlling transport of said film; claw means being controlled by said cam means and being adapted to transport said film, said claw means further being displaceable perpendicularly to the plane of said film to engage and disengage the perforation holes of said film in synchronism with the film-transport movement; biasing means urging said claw means in a direction for perforation engagement; electromagnetic means having an energized and a deenergized condition, wherein in said energized condition said electromagnetic means holds said claw means in a perforation disengaged position against the force of said biasing means;

the improvement wherein said intermittent drive apparatus further comprises movable element means for moving in an axial direction so as to follow the engaging and disengaging displacement of said claw means, said electromagnetic means comprising a core and a clamping member between which said movable element means is sandwiched, first additional biasing means for holding said movable element means at all times in contact with said core and said clamping member of said electromagnetic means, and second additional biasing means for holding

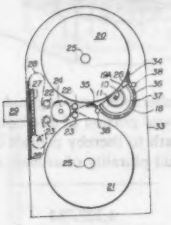
said movable element means at all times in contact with said claw means.

4,227,784

APPARATUS FOR PRE-EXPOSURE OF PHOTOGRAPHIC FILM

Vernon L. Kipping, 540 Melrose Ave., San Francisco, Calif. 94127

Filed Oct. 26, 1978, Ser. No. 955,015
Int. Cl.³ G03B *41/00*
U.S. Cl. 352—244 **4 Claims**



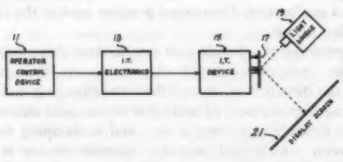
1. A motion picture portable camera for flashing raw film immediately prior to exposure of said film to increase shadow detail, conserve illumination power and lower the initial inertia of exposure threshold of said film comprising a camera housing, an exposure aperture in said camera housing, a raw film magazine on one side of said exposure aperture for containing raw film having at least one image area, a take-up magazine on the side of said exposure aperture opposite said raw film magazine a flashing housing having a flashing aperture located between said raw film magazine and said exposure aperture dimensioned to expose substantially an entire image area of film, a lamp in said flashing housing, guide means for guiding film from said raw film magazine past said flashing aperture for exposure of said film independent of any exposure from a scene to be photographed, and film drive means for transporting film from said raw film magazine past said exposure aperture and into said take-up magazine and also at a uniform rate of linear movement past said flashing housing prior to passage past said exposure aperture, said camera housing, said raw film magazine and said flash housing comprising a single, extraneous light-free path for said raw film such that said raw film is first pre-flashed as it is continuously driven past said flashing aperture and excited and then exposed to the scene to be filmed as it is driven past said exposure aperture.

4,227,785

LIGHT IMAGE TRANSLATOR

Henry J. Herbert, Santa Barbara, Calif.

Continuation of Ser. No. 837,880, Sep. 29, 1977, abandoned, which is a continuation of Ser. No. 675,636, Apr. 9, 1976, abandoned. This application Apr. 30, 1979, Ser. No. 34,437
Int. Cl.³ G03B *21/28*; G05D *25/00*; A63J *17/00*; G02F *1/00*
U.S. Cl. 353—50 **12 Claims**



1. An image translation device adapted for use as an artistic tool for creating light images in response to the manipulations of an artist operator comprising:

an image reflector means mounted to be pivotable about first and second axes;

a control means grippable by the operator's hand and pivotable in response to operator arm movement for developing first and second control signals proportional to said arm movement and further responsive to a plurality of operator wrist movements for developing third and fourth control signals each proportional to a respective said wrist movement;

signal generating means for generating a first electrical signal having an amplitude and frequency and a second electrical signal having an amplitude and frequency, said signal generating means also controlling the amplitude and frequency of said first electrical signal to vary in response to respective first and second said control signals and controlling the amplitude and frequency of said second electrical signal to vary in response to respective third and fourth said control signals;

means for converting said first electrical signal into a force variable at a frequency and amplitude proportional to the frequency and amplitude of said first electrical signal and for converting said second electrical signal into a force variable at a frequency and amplitude proportional to the frequency and amplitude of said second electrical signal; and

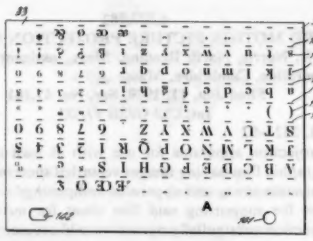
means controlled by said first and second forces for oscillating said reflector means about said first and second axes respectively at said frequencies and in proportion to said amplitudes.

4,227,786

PHOTOPRINTING APPARATUS EMPLOYING BASE LINE CONTROL IMAGING FONT

Milton J. Zorn, Scarsdale, N.Y.; Edward L. Slater, Fort Lauderdale, Fla.; Neil L. Maizner, Plantation, Fla.; Brian J. Eccles, Tamarac, Fla.; Hubert C. Minard, Margate, Fla.; Juko S. Otsuki, Coral Springs, Fla., and Daniel H. Sprengart, Miramar, Fla., assignors to Visual Graphics Corporation, Tamarac, Fla.

Filed Apr. 17, 1979, Ser. No. 30,762
Int. Cl.³ G03B *23/00, 17/26*
U.S. Cl. 354—10 **30 Claims**



24. A photoprinter imaging font comprising a transluscent plannar sheet, a plurality of equally spaced symbols on said sheet, symbol orienting indicia for each symbol, each of said indicia being spaced from the optical center of its symbol an identical distance and spaced position locating and securing means adjacent at least one margin of said sheet.

4,227,787

BULB PHOTOGRAPHING CONTROL SYSTEM FOR AN ELECTRIC SHUTTER CAMERA

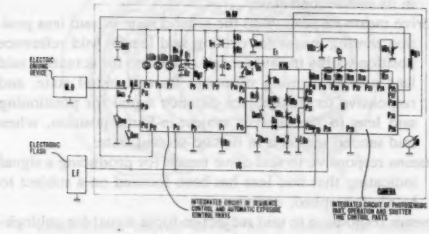
Hiroshi Aizawa, Kawasaki; Masami Shimizu, Tokyo; Masanori Uchidoi, Yokohama; Tokuichi Tsunekawa, Kanagawa; Yukio Iura, Yokosuka, and Masayoshi Yamamichi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 763,718, Jan. 28, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,530

Claims priority, application Japan, Feb. 4, 1976, 51/10998

Int. Cl.[3] G03B *7/097, 9/62*

U.S. Cl. 354—51 **6 Claims**



1. A bulb photographing control system, comprising:

(A) photo-sensing circuit means for receiving object light and for generating an electrical signal corresponding thereto for measuring object brightness;

(B) first switch means which is connected to the photo-sensing circuit means and which places the photo-sensing circuit means in an active state by the first step action of a shutter release;

(C) computing means which computes the exposure information on the basis of object brightness information from the photo-sensing circuit in correspondence with the closing action of the first switch means;

(D) shutter control means which is actuated by the closure of a shutter release switch and which is operated by a second step operation of the shutter release, said shutter closing control means having a time control circuit for controlling the operation time of the shutter;

(E) a power supply holding circuit provided with a shutter release switch which closes after the first switch means is closed by depression of a shutter release button and power supply holding means for maintaining power supply to each of the above stated means after the shutter release switch is closed; and

(F) bulb photographing control means having a bulb switch, positioned between said time control circuit and said first switch means, for selecting bulb photographing and normal photographing, and being designed to prevent generation of actuation signals from the time control circuit by closure of the bulb photographing switch, and to close the shutter by the actuation signal from the time control circuit after the closure of the first switch means.

4,227,788

PRINTED CIRCUIT ASSEMBLY

Masami Shimizu, Tokyo, and Hiroshi Aizawa, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 906,669, May 16, 1978, abandoned, which is a continuation of Ser. No. 737,576, Nov. 1, 1976, abandoned. This application Mar. 30, 1979, Ser. No. 25,721

Int. Cl.[3] G03B *7/08*

U.S. Cl. 354—60 R **28 Claims**

1. A control circuit assembly in a device provided with:

a housing,

a plurality of mechanical parts compactly mounted in said housing, and

a plurality of electrical parts distributed within a plurality of restricted spaces between said housing and said mechanical parts, said assembly comprising:

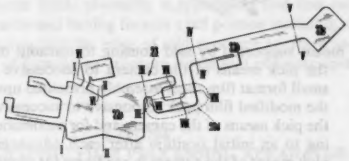
(a) a flexible electrically insulating circuit support substrate, said flexible support substrate being bent into a configuration to fit into a plurality of said restricted spaces within said housing,

(b) control circuit means for controlling at least one mechanical part of said plurality of mechanical parts, said circuit means being mounted on said substrate, and

(c) a plurality of electrical conductors for electrically connecting said plurality of electrical parts to said control means, said conductors being carried on said substrate and electrically connected to said control circuit means,

said plurality of electrical parts being electrically connected to said control circuit means through said conductors.

said flexible substrate being a single continuous substrate having a generally elongated shape in its extended state and having first and second substrate portions and a third substrate portion connecting said first and second portions



with each other, said third portion being connected with said first and said second portions at first and second connecting sections and being bent at a first place in the vicinity of said first section, and at a second place in the vicinity of said second section, and at a third place between said first and second sections; an angle between said first and said second portions being varied in accordance with the change in the bending angle of said third portion at the third place so that said first and said second portions are arranged in said restricted spaces;

the third portion, when the substrate is flat, having a first edge extending from the first portion to the second portion along a line which departs from a straight line and having a second edge which extends from the first portion to the second portion, said substrate being bent at the first and second places so that the third portion is substantially transverse to planes formed by the first and second portions in the vicinity of the first and second places, said first and second portions extending in longitudinal directions with an angle therebetween which depends upon the bending angle at the third place.

4,227,789

PHOTOGRAPHIC SYSTEM ACCESSORY FOR SMALL FORMAT FILM SHEETS

John J. Driscoll, Andover; Nicholas Gold, Arlington; Philip R. Norris, North Reading, and Richard R. Wareham, Marblehead, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1978, Ser. No. 902,064

Int. Cl.[2] G03B *17/02, 17/26, 17/52, 19/06*

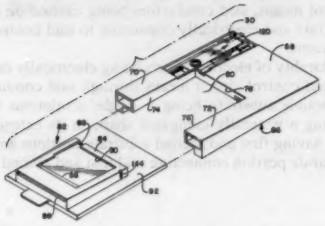
U.S. Cl. 354—86 **12 Claims**

1. In a self-processing photographic system including a camera normally intended to operate with a standard film pack in which film sheet assemblies are successfully presented at a window in an upper marginal wall of a film pack container, the camera having a well to receive and position a standard film pack for exposure of each film sheet assembly through the container window, a processing roller pair defining a pressure nip through which each film sheet assembly is passed for withdrawl from the film pack and ejection from the camera, and pick means for advancing each film sheet assembly from the

standard film pack to the pressure nip of the processing roller pair, the improvement comprising:

an accessory for adapting the camera to expose small format film sheet assemblies carried in a modified film pack of a size smaller than the interior size of the well, said accessory comprising:

a housing having exterior planar dimensions generally complementing the interior planar dimensions of the film pack well, said housing defining a recess to receive and position the modified film pack; and



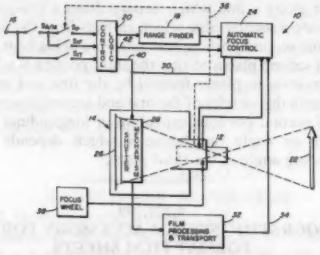
means supported by said housing to transmit movement of the pick means of the camera to successive ones of the small format film sheet assembly presented upwardly from the modified film pack responsive to successive strokes of the pick means of the camera and for automatically returning to an initial position after each advancement of the pick means of the camera in readiness for movement of the next successive small film sheet.

4,227,790

AUTO/MANUAL FOCUS CONTROL MODE SELECTOR

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 899,863, Apr. 25, 1978, abandoned.
This application Mar. 9, 1979, Ser. No. 19,257
Int. Cl.[3] G03B 3/00
U.S. Cl. 354—195 **9 Claims**



1. A photographic camera comprising:

means for defining an image plane;

means for directing scene light along a given optical path to said image plane, said directing means including a lens assembly having a lens mounted for displacement over a focusing range wherein various positons thereof respectively serve to focus an image at said image plane of subjects positioned in various locations within a predetermined range of subject distances, and for further displacement from its said focusing range into a second range wherein it does not serve to focus images at said image plane of subjects positioned within said predetermined subject distance range;

lens position sensing means actuatable between an initial state and a second state for sensing that said lens has moved a predetermined minimum distance from a reference position within the said second range of said displaceable lens;

energizeable first means for determining the distance between said camera and the position of a particular subject within said focusing range for producing a signal indicative of said particular subject distance;

manually actuatable second means actuatable between an initial state and a second state for selecting the focus control mode of said camera;

manually actuatable third means actuatable between an initial state and a second state for coupling said first means to a source of electrical energy when said second means is in its said second state;

drive means responsive to the second state of said lens position sensing means for driving said lens to said reference position within its said second range and for actuating said lens position sensing means to its said initial state, and responsive to said subject distance signal for positioning said lens to the correct subject-in-focus position, when said second means is in its said second state;

means responsive to said drive means for producing a signal indicating that said lens has been focused on a subject to be photographed; and

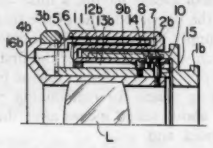
means responsive to said subject-in-focus signal for unblocking and blocking said optical path to produce an exposure interval.

4,227,791

LENS BARREL FOR FLASH PHOTOGRAPHY

Shinsuke Komoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1979, Ser. No. 31,691
Claims priority, application Japan, Apr. 20, 1978, 53/47073
Int. Cl.[3] G03B 3/00
U.S. Cl. 354—196 **2 Claims**



1. In a lens barrel assembly including a fixed cylinder and in which a distance ring is coupled to an aperture ring for rotation relative to said fixed cylinder so that a correct exposure can be obtained in flash photography, the improvement comprising:

rotating member means for rotation integrally with said aperture ring; and

engaging means movable with respect to said fixed cylinder in the direction of an optical axis so that said aperture ring and said distance ring can rotate functionally with each other; and wherein:

said fixed cylinder has a cam groove therein, and said distance ring has a pin engaging said cam groove;

said engaging means has cam groove means for rotating said rotating member means;

said distance ring has a lead groove and a circumferentially extending groove;

said engaging means has a pin engaging said circumferentially extending groove; and

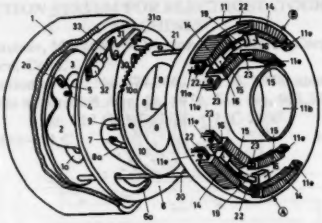
said rotating member means has a pin engaging said lead groove of said distance ring and the cam groove means of said engaging means.

4,227,792

DEVICE FOR SETTING EXPOSURE TIME AND APERTURE SIZE ON CAMERAS

Waldemar Rentschler, Wildbad, Fed. Rep. of Germany, assignor to Prontor-Werk Alfred Gauthier GmbH, Wildbad, Fed. Rep. of Germany

Filed Jun. 26, 1979, Ser. No. 52,281
Int. Cl.[3] G03B 9/24
U.S. Cl. 354—230 17 Claims



1. Controllable shutter device for a camera for achieving extremely short selective exposure times at selectively sized diaphragm apertures when taking photographs with the camera, which comprises

a lens shutter assembly having a lens passage for film exposure fitted with a reciprocating shutter sector system of sectors movable between a closed position and an open position for opening the lens passage and a reciprocating diaphragm segment system of segments movable between a closed position and a selectively sized open position for forming the diaphragm working aperture of the lens passage and for closing the lens passage, and

control means for effecting initial diaphragm adjustment movement of the diaphragm segments at a low movement rate for formation of a selectively sized diaphragm working aperture before film exposure, then for effecting timed exposure shutter opening movement of the shutter sectors from the closed position to the open position for opening the lens passage for film exposure, and thereafter for effecting subsequent shutter closing movement of the diaphragm segments at a correspondingly high movement rate relative to the initial low movement rate thereof, at the end of a selectively timed interval following the timed opening movement of the shutter sectors and corresponding to the selective exposure time, for closing the lens passage, whereby to terminate film exposure.

4,227,793

BLADE TYPE FOCAL PLANE SHUTTER

Kiyoyuki Arai, Tokyo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,680
Claims priority, application Japan, May 20, 1977, 52-58405
Int. Cl.[3] G03B 9/40
U.S. Cl. 354—246 1 Claim

1. A focal plane shutter, comprising:

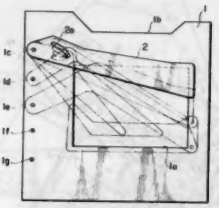
a shutter base plate having an exposure aperture formed therein;

a plurality of auxiliary shutter blades made of opaque laminae and rotatably supported on said base plate by a common shaft to open and close said exposure aperture and having cam slots therein;

a first arm rotatably supported on said base plate and having thereon a pin fitted in said cam slots;

a second arm rotatably supported on said base plate at a position different from said common shaft and having therin a first portion capable of covering the clearance formed by an adjacent pair of said auxiliary shutter blades when said plurality of auxiliary shutter blades are in a position of covering said exposure aperture and a second portion extending from said first portion so as to form an L-shape in cooperation with said first portion;

said second arm being so arranged that said first portion can move by describing substantially the same locus as said plurality of auxiliary shutter blades and said common shaft being placed near to an apparent center of moving locus of said first portion of said second arm; and



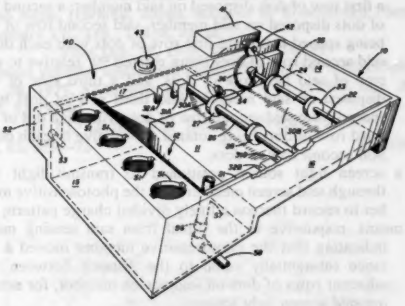
a main shutter blade pivotably supported on said first and second arms and having therein a tail portion including an edge intersecting the edge of said exposure aperture and capable of forming an exposure slit on said exposure aperture.

4,227,794

PHOTOGRAPHIC FILM PROCESSING APPARATUS

Frank Tabin, 1108 Bechtel St., Monaca, Pa. 15061

Filed Aug. 13, 1979, Ser. No. 66,067
Int. Cl.[3] G03D 3/04
U.S. Cl. 354—299 10 Claims



1. Apparatus for use in the chemical development of photographic film comprising

(a) a tank for holding liquid at a selected temperature,

(b) means for circulating liquid within the tank controlling the temperature of the liquid,

(c) a driven axle with at least two wheels thereon of equal diameter journaled across the tank,

(d) a movable idler axle with at least two wheels of equal diameter thereon,

(e) a plurality of means for receiving the idler axle arranged in a plurality of journaled positions parallel to the driven axle,

(f) means for driving the driven axle to turn the wheels attached thereto, and

(g) said wheels movable along the axles without loss of turning engagement,

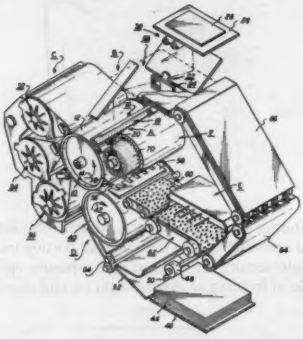
whereby the apparatus may be used to rotate and maintain the temperature of a processing drum placed upon the wheels, the distance between the axles being adjusted to insure adequate immersion of the drum in the liquid.

4,227,795

HALF-TONE IMAGING SYSTEM

Richard M. Bobbe, Rochester; John A. Durbin, Webster; Richard F. Lehman, Fairport, and Frederick A. Seedhouse, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1977, Ser. No. 758,736
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 R 9 Claims



1. An optical system for exposing a movable photosensitive member to a light image of an original document, wherein the improvement includes:

means for sensing the position of the photosensitive member and generating a signal indicative thereof;

a screen member disposed closely adjacent to the photosensitive member, said screen member comprising a member; a first row of dots disposed on said member; a second row of dots disposed on said member, said second row of dots being spaced from said first row of dots with each dot of said second row of dots being rotated 90° relative to each row of said first row of dots, and a third row of dots disposed on said member, said third row of dots being spaced from said second row of dots with each dot of said third row of dots being rotated 45° relative to each dot of said second row of dots;

a screen light source positioned to transmit light rays through said screen member onto the photosensitive member to record thereon a finely divided charge pattern; and

means, responsive to the signal from said sensing means indicating that the photosensitive member moved a distance substantially equal to the distance between two adjacent rows of dots on said screen member, for actuating said screen light source.

4,227,796

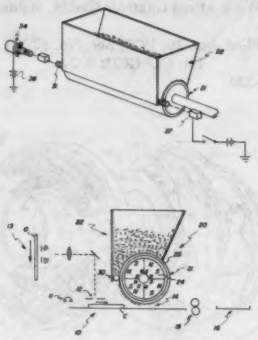
ELECTROGRAPHIC APPARATUS HAVING IMPROVED DEVELOPER METERING CONSTRUCTION

Dennis R. Kamp, Spencerport, and James D. Walling, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1979, Ser. No. 43,580
Int. Cl.[3] G03G *15/00, 15/09*
U.S. Cl. 355—3 DD 15 Claims

1. In electrographic apparatus in which an electrographic imaging member is moved past a development zone for development of an electrical image thereon, said apparatus including (1) developer supply means spaced from said development zone and (2) applicator means for transporting successive quantities of developer from said supply means into transfer relation with successive portions of said image member passing said development zone; an improved device for controlling the flow of developer during such transport, said device comprising:

(a) an elongated coil spring having loops disposed along a longitudinal axis that extends across the path on which developer is transported from said supply means to said development zone; and



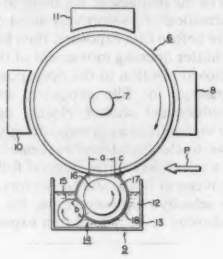
(b) means for distending said spring along said longitudinal axis to provide passages therethrough for predetermined volumes of developer.

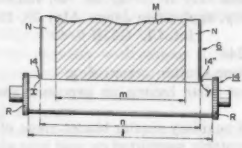
4,227,797

WET DEVELOPING APPARATUS FOR ELECTROSTATIC LATENT IMAGES

Haruo Tsunoi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1978, Ser. No. 961,453
Claims priority, application Japan, Nov. 24, 1977, 52-141000
Int. Cl.[3] G03G *15/10*
U.S. Cl. 355—10 9 Claims





1. A wet developing apparatus of the type which is provided with a rotary member for developing an electrostatic latent image carried on a latent image carrier, said rotary member being elastically deformable and being disposed in pressure contact with said carrier while supplying liquid developer thereto and while recovering residual liquid developer therefrom, said apparatus being characterized in that said rotary member is an elastic roller comprising a porous elastic material

overlaid on the circumference of the roller shaft, and in that the relative position between said rotary member and said latent image carrier is determined so that the width of said rotary member, measured along the axial direction in which said rotary member comes in pressure contact with said latent image carrier, is within the range of from the maximum width of the area in which an electrostatic latent image can be carried by said carrier to the total width of said carrier.

4,227,798

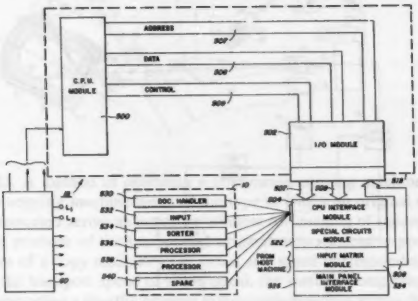
PROTECTION SYSTEM FOR ELECTROSTATOGRAPHIC MACHINES

Edward Steiner, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 677,346, Apr. 15, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,325

Int. Cl.³ G03G *15/00*; G11C *7/00*

U.S. Cl. 355—14 C **16 Claims**



1. In a reproduction machine for producing impressions of an original, the reproduction machine having a photosensitive member and plural discrete operating components cooperable with one another and the photosensitive member to electrostatically produce impressions on a support material, the combination of:

a controller for operating said machine components in accordance with a program whereby to produce the impressions desired,

said program being comprised of both background machine control routines and foreground machine control routines;

interrupt means to temporarily interrupt the machine control routine in progress to refresh control data outputted to said machine components; and

control means effective within a preset interval in relation to said refresh to stop said machine.

4,227,799

IMAGE FORMING APPARATUS

Kohei Nonaka, Yokohama; Masahiro Koyama, Kawasaki; Makoto Gonmori, Tokyo; Takeo Kimura, and Tetsuo Shiga, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1979, Ser. No. 63,310

Claims priority, application Japan, Aug. 8, 1978, 53-97134; Aug. 10, 1978, 53-97989

Int. Cl.³ G03B *27/32, 27/52*

U.S. Cl. 355—27 **21 Claims**

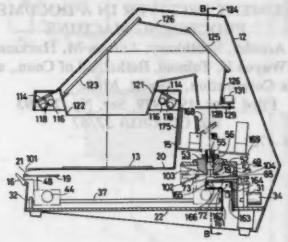
1. Image forming apparatus for forming an image using a heat-developable image forming sheet that is normally non-photosensitive but can be rendered photosensitive by preheating prior to exposure and exposed to a light image to form therein a latent image and then heat-developed to produce a visible image, comprising:

first heating means for preheating one image forming area of the image forming sheet;

exposure means for projecting an optical image of a subject to the preheated image forming area;

second heating means for heat-developing the exposed image forming area; and

transfer means for transferring the image forming sheet to the first heating means, the exposure means and the second heating means;



wherein the first heating means, the exposure means and the second heating means are each provided with fixing means for fixing the image forming area of the image forming sheet at the processing position of each means, and wherein the first heating means, the exposure means and the second heating means are arranged so that individual image forming areas of the image forming sheet can be simultaneously processed by the respective means in parallel.

4,227,800

APPARATUS FOR LOADING CASSETTE CONTAINING RECORDING SHEETS

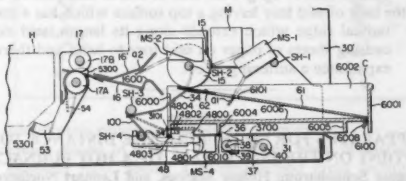
Takao Nezu, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1978, Ser. No. 974,101

Claims priority, application Japan, Dec. 28, 1977, 52-157498; Dec. 28, 1977, 52-157499; Dec. 28, 1977, 52-157500; Dec. 28, 1977, 52-157501

Int. Cl.³ G03B *27/58*; B65H *1/12*; G03G *27/48*

U.S. Cl. 355—72 **4 Claims**



1. Apparatus for loading a cassette containing therein a plurality of sheets into a device wherein the sheets are processed, said apparatus comprising:

an actuator lever pivotally mounted on said device;

a cassette locking member which is capable of projecting into an operative position within a cassette receiving space of said device;

a first connecting means for connecting said actuator lever and said locking member to each other in such manner that said locking member is displaced from its operative position within the cassette receiving space to an inoperative position exterior of the cassette receiving space when an end of said lever remote from its pivotal mounting on said device is moved to a cassette loading position thereof;

sheet lifting means capable of projecting into an operative position within the cassette receiving space; and

a second connecting means for connecting said sheet lifting

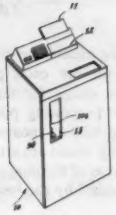
means and said actuator lever to each other in such manner that said sheet lifting means is displaced from its operative position within the cassette receiving space to a position exterior of the cassette receiving space when said end of the lever is moved to said cassette loading position for loading the cassette into said device.

4,227,801

DOCUMENT RECEIVER IN A DOCUMENT PROCESSING MACHINE

Douglas R. Arnoldi, Southbury; Antoon M. Hurkmans, Bethlehem, and Wayne D. Tolman, Bethel, all of Conn., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 19, 1979, Ser. No. 21,493
Int. Cl.³ G03B *27/62*
U.S. Cl. 355—75 **10 Claims**



1. Document receiving and storing apparatus comprising

a generally L-shaped tray including a generally vertical base having an upper end and a lower end, and a lip extending perpendicularly from the base at the lower end thereof,

a first pair of first rollers freely rotatably mounted on a first horizontal shaft disposed parallel to and adjacent to said lip,

a second pair of second rollers freely rotatably mounted on a second horizontal shaft disposed parallel to said first shaft, said second rollers being positioned so that each second roller engages the hub of one of said first rollers,

the base of said tray having a top surface which has a longitudinal ridge which extends along its length, said ridge causing sheets of paper on said tray to bend and thereby experience a stiffening effect.

4,227,802

APPARATUS FOR MEASURING THE DISTANCE TO A POINT ON THE INNER WALL OF A HOT FURNACE

Ragnar Scholdstrom; Holger Marcus, and Lennart Nordstrom, all of Lidingo, Sweden, assignors to AGA Aktiebolag, Sweden

Continuation-in-part of Ser. No. 635,081, Nov. 25, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,346
Claims priority application Sweden, Nov. 20, 1974, 7414531
Int. Cl.³ G01C *3/00*; G01B *11/06*; G02B *5/22*
U.S. Cl. 356—5 **1 Claim**

1. A method for measuring the change in thickness between a first time and a second time of the lining on the inner wall of a furnace having a temperature of at least 500° C., said method comprising the steps of:

providing an electro-optical distance measuring instrument having the capability of transmitting a modulating radiation signal within a narrow frequency band, receiving the reflected transmitted signal, and determining by phase comparison methods the distance from the electro-optical measuring instrument to the point of reflection;

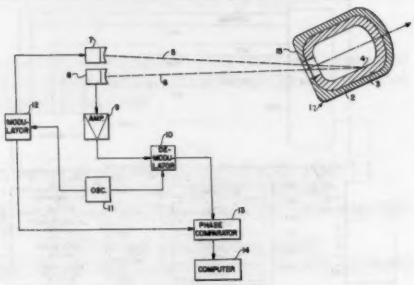
providing an optical filter aligned only in the receiving path of said electro-optical distance measuring instrument to filter out all radiation other than said narrow frequency band of transmitted radiation, said optical filter comprising the combination of an interference filter and a Fabry-Perot filter wherein the central pass band of the Fabry-Perot filter lies within the pass band of the interference filter and the side bands of the Fabry-Perot filter lie outside the pass band of the interference filter;

performing at the first time a first measurement of the distance from the electro-optical distance measuring instrument to a first point on the lining on the inner wall of the furnace, said first measurement being performed by:

(i) focusing said modulated radiation signal of said electro-optical distance measuring instrument on said first point on the inner lining of the furnace;

(ii) receiving the reflected transmitted signal from said first point through said optical filter; and

(iii) determining by phase comparison methods the distance from the electro-optical distance measuring instrument to said first point on the inner wall of said furnace;



determining the distance from said first point to a reference point fixed in relation to said furnace;

performing at the second time a second measurement of the distance from the electro-optical distance measuring instrument to a second point on the lining on the inner wall of the furnace, said second point being in the vicinity of said first point, and said second measurement being performed by:

(i) focusing said modulated radiation signal on said second point on the inner wall of said furnace;

(ii) receiving the reflected transmitted signal from said second point through the optical filter; and

(iii) determining by phase comparison methods the distance from the electro-optical distance measurement instrument to said second point;

determining the distance from said second point to said reference point; and

comparing said distance from said first point to said reference point with said distance from said second point to said reference point, and determining therefrom the change in thickness of said lining.

4,227,803

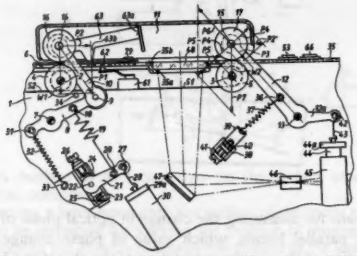
CONTINUOUS COPYING MACHINE

Hans A. Massengeil; Georg Bock, and Fritz Steinlehner, all of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,595
Claims priority, application Fed. Rep. of Germany, May 10, 1978, 2843521; May 10, 1978, 2843522
Int. Cl.³ G03B *27/48, 27/50*
U.S. Cl. 355—50 **23 Claims**

1. In a continuous copying machine of the type in which an original is transported across an exposure window for imaging of successive portions of the transported original upon successive portions of a copy medium transported at a speed corresponding to the transport speed of the original, in combination,

a pair of infeed rollers located upstream of the exposure window, including stationary mounting means mounting one infeed roller, the other infeed roller being movable; a pair of outfeed rollers located downstream of the exposure window, mounting one outfeed roller, the other outfeed roller being movable; a multi-link linkage mechanism mounting the movable infeed roller and the movable outfeed roller for interdependent movement into and out of engagement with the stationary infeed roller and the stationary outfeel roller, respectively; and means for applying to the movable rollers through the intermediary of the multi-link linkage mechanism a roller pressing force pressing them against the stationary rollers.



23. A method of operating a continuous copying machine, the copying machine being of the type in which an original is transported across an exposure window for imaging of successive portions of the transported original onto successive portions of a copy medium transported at a speed corresponding to the transport speed of the original, the method comprising transporting a lengthy original in forwards direction across the exposure window to effect copying of a limited section of the original upon a sheet of copying medium, and then transporting the original in the opposite direction by a distance at least equal to the transport-direction length of the exposure window, and then transporting the original once again in forwards direction across the exposure window to effect copying of the next limited section of the original.

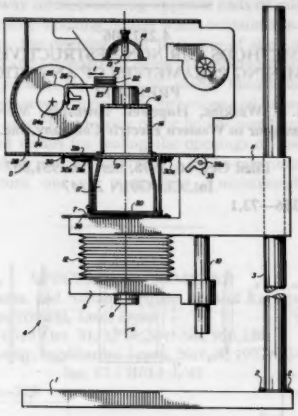
4,227,804

ILLUMINATING APPARATUS WITH A LIGHT CONTROL CHANNEL FOR PHOTOGRAPHIC ENLARGING EQUIPMENT WITH A ROTATABLE PICTURE STAGE IN THE PLANE OF THE NEGATIVE TO BE COPIED

Wilhelm Pramstraller, Brixen, Italy, assignor to Durst AG Fabrik Fototechnischer Apparate, Bozen, Italy

Filed Mar. 26, 1979, Ser. No. 23,544
Claims priority, application Italy, May 26, 1978, 4832 A/78
Int. Cl.³ G03B *27/54, 27/62*
U.S. Cl. 355—67 **15 Claims**

1. In a photographic enlarging apparatus having a light source and a rotatable picture stage for receiving and supporting a negative to be projected, the improvement comprising: means comprising a light control channel positioned on the light entrance side of said picture stage and secured to said



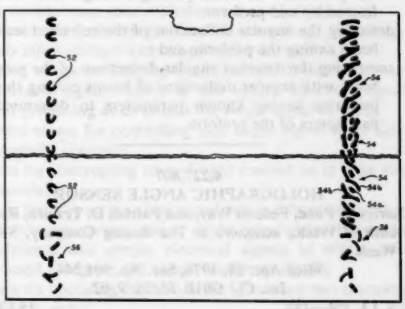
stage for rotation therewith about an axis normal to the plane of said negative.

4,227,805

FINGER IDENTIFICATION APPARATUS AND METHOD

Michael Schiller, 4465 Douglas Ave., Riverdale, N.Y. 10471

Filed Jan. 25, 1978, Ser. No. 872,263
Int. Cl.³ G06K *9/00, 9/76*
U.S. Cl. 356—71 **16 Claims**



1. Fingerpress processing apparatus comprising:
scanning means to scan an interrogating beam of spatially coherent light having a predetermined cross sectional shape across a fingerpress to provide a reflected light beam modulated with minutia identification information,
a holographic correlator coupled to said reflected light beam,
said correlator including a hologram of a predetermined character plate having a plurality of standardized finger identification minutia, said minutia including a first set of bifurcation minutia and a second set of line ending minutia, each of the bifurcation minutia in the first set being identical to one another in shape and having an angular orientation unique relative to all other bifurcation minutia, each of said line ending minutia being identical to one another in shape and having an angular orientation unique relative to all other line ending minutia, each of said standardized minutia having a predetermined spatial position on said character plate, and
projection means to project the Fourier transform of said reflected light beam onto said hologram to provide a

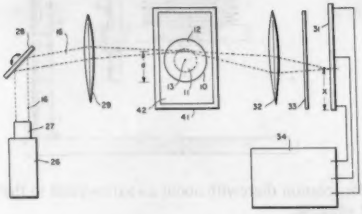
plurality of correlation light beams indicative of the minutia being scanned on said fingerpress.

4,227,806

METHODS FOR NON-DESTRUCTIVELY DETERMINING PARAMETERS OF AN OPTICAL FIBER PREFORM

Laurence S. Watkins, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,807
Int. Cl.³ G01N *21/47*
U.S. Cl. 356—73.1 **12 Claims**



1. A method of determining parameters of a cylindrical optical fiber preform having a core and a cladding, comprising the steps of:

scanning at least a portion of the cylindrical surface of the preform with a narrow, parallel scanning beam of coherent light, the parallel scanning beam being located within a plane which is perpendicular to the longitudinal axis of the preform, said beam passing through and being refracted by said preform;

detecting the angular deflections of the refracted scanning beam exiting the preform; and

comparing the detected angular deflections of the scanning beam with angular deflections of beams passing through preforms having known parameters to determine the parameters of the preform.

4,227,807

HOLOGRAPHIC ANGLE SENSOR

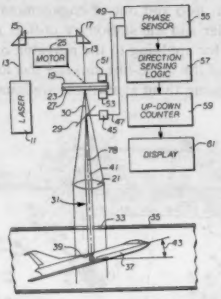
Charles R. Pond, Federal Way, and Patrick D. Texeira, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 28, 1978, Ser. No. 901,244
Int. Cl.³ G01B *11/26, 9/02*
U.S. Cl. 356—152 **15 Claims**

1. An apparatus for determining the angular orientation of an object, comprising:

(a) means for generating a partially coherent light beam;

(b) reflector means positioned on said object, said reflector means including means for producing at least two derivative beams from an incident beam, said beam producing means being positioned relative to said reflector means such that a light beam passes through said beam producing means upon entry and exit from said reflector means, wherein said beam producing means produces two original derivative beams from an incident beam entering said reflector means in such a manner that said two original beams travel paths of different length within the reflector means between entry and exit thereof, the difference in path length between said two original beams being representative of the angular orientation of the object, and wherein said beam producing means produces at least two additional divergent beams from each of said two original beams upon exit of the original beams from said reflector, at least one additional beam produced from one of the original beams being parallel to one additional beam produced from the other of the original beams, said two parallel beams being characterized by a separation sufficiently small that the wavefronts thereof are substantially equally affected by changes in the index of refraction across the medium through which said two parallel means are moving; and



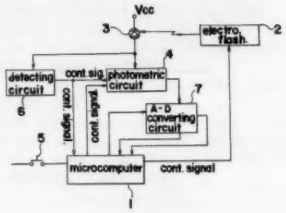
(c) means for measuring the change in optical phase of said two parallel beams, which value of phase change is a function of the angular orientation of the object and hence is correlatable to a corresponding value of the angular orientation of the object.

4,227,808

DIGITAL LIGHT MEASURING DEVICE

Yoshio Yuasa, Kawachinagano, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1978, Ser. No. 968,972
Claims priority, application Japan, Dec. 29, 1977, 52-157685
Int. Cl.³ G01J *1/42, 1/46;* G03B *7/08, 7/00*
U.S. Cl. 356—218 **6 Claims**

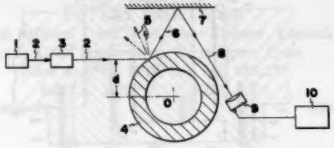


6. A digital light measuring device capable of measuring a flash of light generated by a separate light source device comprises means responsive to an incident light intensity for producing an output commensurate thereto; means for processing said output to form a digital signal indicative of a result of the light measurement; means for detecting the beginning of change in the output of the producing means caused by a flashing to generate a start signal for making said processing means begin said processing operation; and means for controlling the operations of said processing means in a programmed sequence, said control means being adapted to start said programmed sequence in response to the start signal of said detecting means.

4,227,809
METHOD OF DETECTING FLAWS ON THE SURFACE OF METAL

Masakazu Satoh, Mito; Miyuki Igarashi, and Shigeo Senoo, both of Ibaraki, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 945,070
Claims priority, application Japan, Sep. 30, 1977, 52/116698
Int. Cl.[3] G01N *21/00*
U.S. Cl. 356—237 6 Claims



5. A method of detecting flaw on the surface of a metal material, comprising:

directing a laser beam onto the surface of the metal material to be inspected for varying the position of impingement;

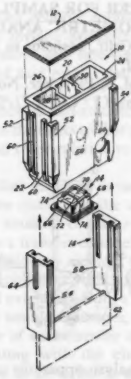
reflecting the directly reflected component of the laser beam which is reflected from the surface of the metal material from a reflector having a rough surface; and

measuring the change in the quantity of light in the beam reflected from said reflector and using the changes in the measuring quantities of light for detecting the presence of flaws on the surface of the metal material.

4,227,810
CUVETTE AND METHOD OF USE

Harold E. Sandrock, Rockville Centre; Morris W. Leen, Yorktown Hgts., and Edward W. Stark, Garden City, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Division of Ser. No. 739,902, Nov. 8, 1976, Pat. No. 4,083,638, which is a division of Ser. No. 604,526, Aug. 14, 1975, Pat. No. 3,994,594. This application Jan. 26, 1978, Ser. No. 872,404
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.[2] G01N *1/10*
U.S. Cl. 356—246 13 Claims

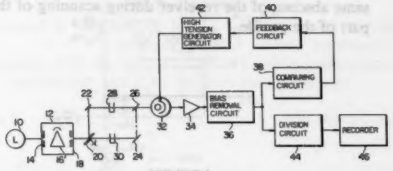


1. A cuvette comprising a body member including means defining two distinct chambers, a pair of windows defined in at least one of said chambers for viewing the optical density of the contents thereof, each of said chambers defining at corresponding ends an opening through which reactants may be selectively introduced into said chambers, means defining a fluid passageway interconnecting opposite ends of said chambers and normally isolating liquids when contained in each of said chambers, the opening of at least one of said chambers being adapted and arranged for being in operative communication with a pressurizing means to enable forced-fluid flow along said passageway in opposite directions and between said chambers, so as to effect mixing of the liquids contained in said chambers, and means for sealing the openings of said chambers, said sealing means comprising a probe-puncturable plural-ply structure, one ply comprising a moisture-absorbent material.

4,227,811
SPECTROPHOTOMETER

Shigeo Tohyama, and Nobuo Akitomo, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 31, 1978, Ser. No. 956,238
Claims priority, application Japan, Nov. 4, 1977, 52-132744
Int. Cl.[2] G01J *3/42*
U.S. Cl. 356—325 4 Claims



1. A double-beam spectrophotometer comprising:

photoelectric converting means for converting optical signals into reference and sample electrical signals;

judging means for judging the magnitude of said reference electrical signal relative to said sample electrical signal and producing as an output the larger signal of them;

control means for controlling said larger signal to be substantially constant;

means for interrupting rays of light emitted on at least one material;

means for subtracting a bias signal obtained from said photoelectric converting means at the interruption from said reference and sample electrical signals to obtain subtracted reference and sample electrical signals;

means for operating the ratio of the subtracted two electrical signals; and

means for displaying the ratio of said reference and sample electrical signals.

4,227,812
METHOD OF DETERMINING A DIMENSION OF AN ARTICLE

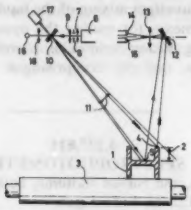
Robert A. Pirlet, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Mar. 7, 1978, Ser. No. 884,151
Claims priority, application Belgium, Mar. 10, 1977, 852371; Mar. 10, 1977, 852372
Int. Cl.[3] B01B *11/00*; G01C *3/20*
U.S. Cl. 356—372 3 Claims

1. A method of determining a dimension of an article, comprising directing a beam at the article by means of a first mobile deflector and scanning the part of the profile of the article comprising the dimension to be measured, orientating rays reflected by the article in the direction of at least one receiver by means of a second mobile deflector, angularly moving the deflectors at different speeds, determining the positions occu-

pied by two points related with the dimension to be measured, and calculating the dimension with respect to these points;

wherein during the time taken by one of said deflectors to scan one of the various parts of the profile of the article, the other one of said deflectors completely scans all of the



said various parts of the profile of the article, the optical members being arranged one with respect to the other in such a way that the rays reflected by one of the various parts of the profile of the article remain substantially at the same abscissa of the receiver during scanning of the said part of the profile.

4,227,813

PROCESS FOR DETERMINING A DIMENSION OF AN OBJECT

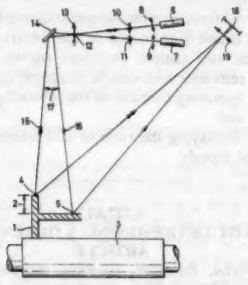
Robert A. Pirlet, Embourg, Belgium, assignor to Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Mar. 7, 1978, Ser. No. 884,169

Claims priority, application Belgium, Mar. 10, 1977, 852370; Mar. 10, 1977, 852372

Int. Cl.³ G01B *11/00*; G01C *3/20*

U.S. Cl. 356—372 **21 Claims**



1. A process for determining a dimension of an object, comprising: directing two diverging emitted beams, whose axes define a known angle, by means of a deflector onto points of the object related to the dimension to be determined so that when one of these beams falls on the first of two points defining the dimension the other beam falls on the second point; receiving light rays reflected by the two points as two received beams, by means of a receiver; measuring, with respect to a reference direction, the angle of incidence of the emitted beams and the angles made respectively by the axes of the two received beams with the axes of the emitted beams; and calculating the dimension from the angles

4,227,814

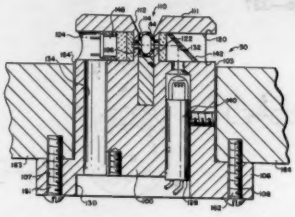
OPTICAL DENSITY DETECTOR

Charles Soodak, Silver Spring; Rene G. Lamadrid, Bethesda, and David Lohr, Ellicott City, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 1, 1979, Ser. No. 8,274

Int. Cl.³ G01N *21/85*

U.S. Cl. 356—410 **16 Claims**



1. An optical density detector for sensing the change in optical density of a fluid flowing in a flexible, light transmitting tubing, said detector comprising a block having a slot across one face thereof, the inner portion of said slot having a width less than the outer diameter of the tubing which is received in said slot such that the tubing is squeezed from a circular cross section to an oval cross section with two respective flat portions adjacent opposite sidewalls of said slot, a first cavity in said block located behind a first sidewall of said slot and a second cavity in said block located behind a second sidewall of said slot, a first aperture in said first sidewall and a second aperture in said second sidewall, said apertures being coaxial, low power light generating means for directing light from said first cavity through said first aperture, through the flat portions of the tubing and through said second aperture into said second cavity and light sensing means in said second cavity for sensing the amount of light passed through the tubing and received in said second cavity and for generating an electrical signal which is indicative of the amount of light sensed and which can be utilized for measuring the optical density of the fluid flowing through the tubing, and said block being constructed in a manner to dissipate heat generated by said light generating means.

4,227,815

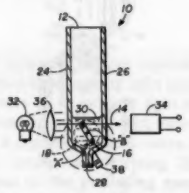
MAGNETIC STIRRER FOR SAMPLE CONTAINER OF PHOTOMETRIC ANALYZER

Jack L. Hoffa, Brea, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1979, Ser. No. 55,251

Int. Cl.³ G01N *21/01*

U.S. Cl. 356—436 **4 Claims**



1. In photometric analysis apparatus comprising a container for receiving sample material, means establishing an optical path for light to intercept sample material in the container, and means for monitoring light exiting the container along the optical path to measure a characteristic of the sample material, the improvement characterized by:

a magnetic stirring element within the container for stirring sample material therein;

means magnetically coupled to the stirring element for rotating the stirring element in a rotational path which intersects and hence in which the stirring element obstructs at least a portion of the optical path within the container; and

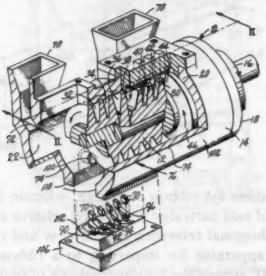
means for controllably stopping rotation of the stirring element in an orientation out of the optical path thereby allowing optical measurement of the sample material unobstructed by the stirring element.

4,227,816

ROTARY PROCESSOR

Peter Hold, Milford, Conn., and Zehev Tadmor, Teaneck, N.J., assignors to USM Corporation, Farmington, Conn.

Filed Aug. 21, 1978, Ser. No. 935,257
Int. Cl.³ B01F 7/08; B28C 1/16
U.S. Cl. 366—99 **30 Claims**



1. In a processor for plastic and polymeric materials which are or become in the course of processing viscous liquids comprising:

(a) a rotor including a substantially cylindrical surface portion and a plurality of coaxial channels having opposing side walls extending inwardly from said cylindrical surface portions,

(b) a stationary element providing a closure surface coaxial with said rotor and cooperating with said cylindrical surface portion of said rotor to form with said channels, enclosed annular passages,

(c) inlets for polymeric or plastic material to said annular passages,

(d) means for causing relative rotation between said rotor and said closure surface providing element about their common axis to move said side walls and said cylindrical surface portion of said rotor relative to said closure surface,

(e) an outlet from each of said annular passages circumferentially spaced from the inlets to that passage in the direction of rotation of said rotor relative to said stationary closure surface,

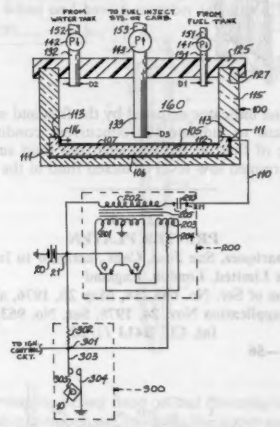
(f) a blocking member disposed in each of said annular passages between the outlet and the inlet of each passage in the direction of rotation of said rotor, the improvement which comprises a transfer channel formed in said closure surface of said stationary element so that the open side of the transfer channel faces said cylindrical surface portion of said rotor and extending from a first annular passage to a second of said annular passages, portion s of the length of the open side of said transfer channel extending over and communicating with the channels of said annular passages to serve as an outlet to discharge material from said first annular passage and as an inlet for said second annular passage to receive material from said first annular passage and where portions of the length of the open side of the transfer channel between said annular passages are sealed by said cylindrical surface portion of said rotor to form an enclosed transfer passage in which said sealing cylindrical portion of said rotor is movable relative to said transfer channel to act on material in said transfer passage.

4,227,817

FUEL AND WATER HOMOGENIZATION MEANS

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Dec. 26, 1978, Ser. No. 972,953
Int. Cl.³ B01F 11/02
U.S. Cl. 366—127 **9 Claims**



1. A system supplied by metered sources of liquid fuel and water for homogenizing said fuel and water and feeding the homogenized fuel and water in its liquid state to vaporization means of an engine, comprising the combination of:

an AC power source;

homogenizing means, having a first feeder line connected to the source of liquid fuel and a second feeder line connected to the source of water, for receiving said liquid fuel and water in metered quatitites, said homogenizing means including transducing means retained within and being part of said homogenizing means, said transducing means being connected directly to the AC power source for converting AC power from said AC power source to vibrations so as to produce a homogenized liquid of said liquid fuel and water; and

means, coupling said homogenizing means to said vaporization means, for transferring said homogenized liquid only to said vaporization means.

4,227,818

WARNING SYSTEM FOR FLUID MIXING AND DISPENSING SYSTEM

Leonard W. Gacki, White Plains, and Robert E. Daly, Farmingdale, both of N.Y., assignors to Picker Corp., Cleveland, Ohio

Division of Ser. No. 609,957, Sep. 3, 1975, Pat. No. 4,103,358. This application Nov. 7, 1977, Ser. No. 849,127
Int. Cl.³ B01F 13/04, 15/02
U.S. Cl. 366—142 **21 Claims**

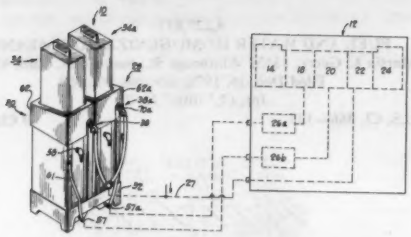
1. In a fluid mixer for mixing first and second fluids in a reservoir wherein the system includes a containerized supply for the first fluid, a warning system for indicating the status of the various fluids, comprising:

(a) a first sensing means responsive to the presence or absence of a predetermined quantity of the first fluid in the containerized fluid supply;

(b) a second sensing means responsive to the level of mixed fluid in the reservoir;

(c) a first indicator actuated by the first sensing means to

indicate an absence of fluid in the containerized fluid supply; and



(d) a second indicator actuated by the first and second sensing means to indicate the concurrent conditions of an absence of fluid in the containerized fluid supply and a predetermined low level of mixed fluid in the reservoir.

4,227,819

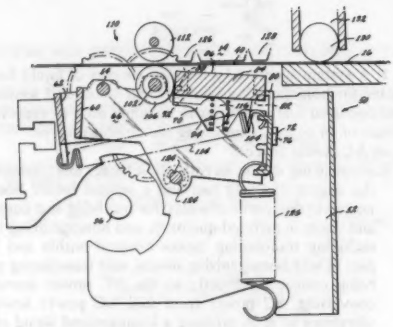
PRINTER PLATEN

Ralph F. Manriquez, San Jose, Calif., assignor to International Computers Limited, London, England

Continuation of Ser. No. 688,214, May 20, 1976, abandoned. This application Nov. 24, 1978, Ser. No. 963,210

Int. Cl.[2] B41J *11/20*

U.S. Cl. 400—56 **3 Claims**



1. A platen assembly for holding one or more layers of record media at a predetermined position relative to a print head for printing characters on the record media including,

(a) record media guide means positioned in a plane adjacent to the print head and effective to determine the position of the record media relative to the print head;

(b) a platen having a surface for co-operating with the print head;

(c) a platen bail mounting the platen for displacement to and from the printing position;

(d) means resiliently loading the platen with respect to the platen bail in the sense towards the printing positions;

(e) means resiliently biasing the platen bail away from the printing position;

(f) means for moving the platen bail against the resilient biasing thereof to advance the platen to the printing position;

(g) record media feed means for feeding the record media relative to the print head;

(h) support means for supporting the record media feed means for displacement to and from a printing position; and

(i) means acting between the platen bail and the support means for the record media feed means for subjecting the support means to a biasing force acting relative to the platen bail and such as to urge the feed means towards its position for co-operation with the record media, and such that the platen bail and support means are movable in unison with respect to the record media and also separately of each other with respect to the record media whereby changes in the thickness of the record media are accommodated by changes in the displacements of platen bail and the support means.

4,227,820

ENDLESS INK-RIBBON CARTRIDGE

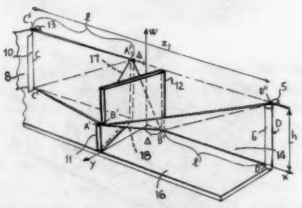
Carlo G. Falcetti, Milan, Italy, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 17, 1978, Ser. No. 896,642

Claims priority, application Italy, Apr. 21, 1977, 22674 A/77

Int. Cl.[3] B41J *33/10*

U.S. Cl. 400—195 **6 Claims**



1. In an endless ink-ribbon cartridge, wherein the structure of a portion of said cartridge is oriented relative to a cartesian system of orthogonal reference axes x, y, w and related reference planes, apparatus for imparting to a ribbon an angular rotation of 180° around the longitudinal axis of said ribbon with minimum friction when said ribbon is in motion, said ribbon having first and second edges and a width h, said rotation being imparted to said ribbon in an inversion zone delimited by a pair of end guide slots within which said ribbon passes; said slots being located in the x-w plane substantially equidistant from the w axis and on the same side of the x axis such that one edge of said ribbon coincides with said x axis in at least said slots, comprising:

a pair of deflecting elements, each of said elements having a substantially rectilinear guiding edge, said elements being disposed in the path of said ribbon, each of said guiding edges acting on a different face of said ribbon for imparting a bending to said ribbon,

said guiding edges intersecting substantially in the y-w plane at a distance from the x-y plane substantially equal to h/2 and defining a plane of inversion in conformity with which said ribbon is bent between said guiding edges, said plane of inversion being perpendicular to the x-w plane and having a slope with respect to the x-y plane such that the paths of said ribbon edges in the inversion zone are of equal length.

4,227,821

WEB DRIVE MECHANISM FOR LINE/SERIES PRINTERS

Mario G. Plaza, Fremont, and James E. Cushman, San Jose, both of Calif., assignors to Durango Systems, Inc., San Jose, Calif.

Filed Sep. 20, 1978, Ser. No. 943,789

Int. Cl.[3] B41J *15/00*

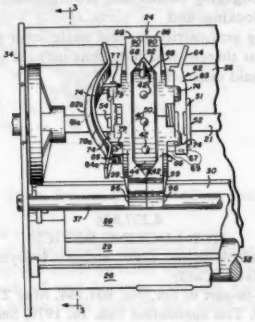
U.S. Cl. 400—616.3 **15 Claims**

1. A web drive mechanism for the print medium of a printer comprising:

a first stationary guide track for guiding a web print medium along a defined path intermediate a web supply position and a printer position, the guide track having an arcuate portion;

a platen about the printing position for receiving the print medium;

at least one spur drive member positioned within the guide track along the defined path intermediate the supply position and the platen, the spur drive member having a spur wheel with a plurality of spurs about its outer peripheral rim and projecting radially from the peripheral surface of said rim, the spurs being axially positioned equally relative to one another, the wheel further having a main hub forming a spring receiving slot, and a spoke member projecting radially from the hub and interconnecting with the rim; a coil spring within said spring receiving slot; a flexible spline member within the hub for frictionally interengaging the hub and a drive shaft, the spline member having a shoulder about one end in abuttment with said coil spring; a housing formed of a pair of saucers positioned in face-to-face abuttment, said saucers each having a first and a second slot about its edge with said first slot of each saucer in facing alignment to said first slot of said other saucer to form a first opening about the periphery of the housing and the second slots of each saucer in facing alignment with said second slot of the other saucer to form a second opening about the periphery of the housing; and a first pivotable web gate pivotable between a first position over said first opening and a second position retracted from said first opening; and



a drive means engaging said drive shaft in turn engaging the spur drive member for driving the spur wheel about its axis of rotation; whereby the spur drive member drives the print medium from the supply position to feed the print medium to the platen position and simultaneously drives the print medium from the platen position to feed the print medium to the take-up position.

4,227,822

COMPOSITE WRITING INSTRUMENT

Teruo Kokubu, Hoyashi, Japan, assignor to Zebra Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 931,279

Claims priority, application Japan, Aug. 5, 1977, 52-104266[U]

Int. Cl.[2] B43K *27/02, 24/16*

U.S. Cl. 401—17 **2 Claims**

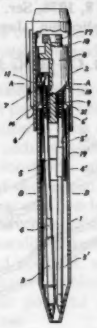
1. A composite writing instrument comprising:

a power tubular casing having a front end opening and an open rear end;

a guide sleeve inserted into the open rear end of said lower tubular casing, said guide sleeve having two diametrically opposite axially extending guide grooves therein and having a head member at the top;

a mechanical pencil unit and a ball point pen unit within said lower tubular casing with the writing tips towards the front end opening of said lower tubular casing and each having a slider on the rear end portion thereof resiliently slidably guided in a corresponding one of said guide grooves, said mechanical pencil unit having an axially movable portion connected to said slider and reciprocally movable for feeding lead out of the front end of said mechanical pencil unit;

a cylindrical casing member around said guide sleeve and rotatable around said guide sleeve through about 180°, said casing member having a cam surface thereon engaged with said sliders for moving one of said sliders downwardly for moving one unit forwardly out of the lower tubular casing when said casing member is rotated in one direction and moving the other slider downwardly for moving the other unit forwardly out of the lower tubular casing when said casing member is rotated in the other direction;



an upper tubular casing fixed on and covering said cylindrical casing member and covering the upper end portion of said lower tubular casing;

one of said members having cam means thereon and the other member having a cam follower thereon engaging with said cam means, said cam means and said cam follower being shaped for locking said casing member in a fixed axial position when said casing member is rotated in a direction for moving said ball point pen unit out of said lower tubular casing and for freeing said casing member for limited axial movement for moving the slider on said mechanical pencil unit for axially moving said portion of said mechanical pencil unit a sufficient distance to feed lead when said casing member is rotated in the direction for moving said mechanical pencil unit out of said lower tubular casing.

4,227,823

WRITING INSTRUMENT

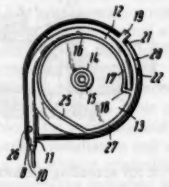
Ernst R. Kitzerow, Wedel, Fed. Rep. of Germany, assignor to Berendsohn AG, Hamburg, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 972,764

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 7802226[U]

Int. Cl.[3] B43K *7/12*

U.S. Cl. 401—99 **18 Claims**



1. A writing instrument comprising a body, a writing point

secured to a flexible tubular ink reservoir mounted upon a rotatable bearing structure arranged within said body, said point and said ink reservoir being movable relative to said body along a path between a retracted inoperable position and a projected writing position, wherein said ink reservoir performs a nonlinear movement as said point is moved along said path.

4,227,824

NON-TARNISHING PANEL EDGE SPOT WELDING ARRANGEMENT

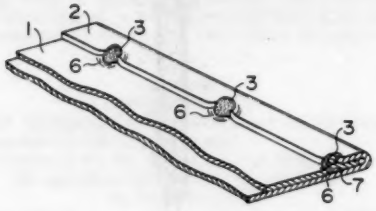
Kunio Ikawa, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Dec. 8, 1978, Ser. No. 967,911

Claims priority, application Japan, Dec. 9, 1977, 52-165838[U]

Int. Cl.² B25G *3/34*

U.S. Cl. 403—271 **6 Claims**



1. Panel assembly for automobiles which comprises inner and outer panels, said inner panel having projection means formed along at least one peripheral portion thereof so as to project in a direction perpendicularly opposite to the outer panel, said outer panel having at least one peripheral portion bent and folded over the peripheral portion of the inner panel, said peripheral portion of the outer panel having an edge portion which is located on and welded to the projection means of the inner panel.

4,227,825

RELEASE DEVICE FOR THE AUTOMATIC RAPID BRAKING OF MOVING MACHINE PARTS, PARTICULARLY OF LOOMS

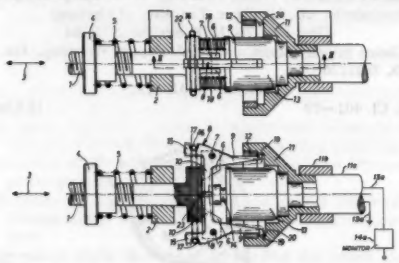
Gerhard Oesterle, Staad, Switzerland, assignor to Adolph Saurer Limited, Arbon, Switzerland

Filed Dec. 4, 1978, Ser. No. 966,487

Claims priority, application Switzerland, Dec. 6, 1977, 014940/77

Int. Cl.² F16D *1/00*

U.S. Cl. 403—322 **2 Claims**



1. A release device for actuating the automatic rapid braking of moving machine parts, such as weaving looms of the type having a braking actuating linkage subject to the action of forces in the direction of actuation and maintained locked when the brake is released, and an electromagnet for unlocking the braking actuating linkage, energization of which is controlled by signals from monitoring members produced in case of breakdowns, said device comprising:

said electromagnet having a movable magnetic core carried generally coaxially with the direction of movement of the braking actuating linkage;

a stator housing which is open in the direction of braking actuation and which includes an inwardly extending projection in the region of its opening;

said braking actuating linkage including at least one angle lever pivotable in an axial plane;

a locking arm carried by said angle lever extending essentially in the direction of movement of the braking actuating linkage and terminating in a hook portion in the region of the opening of the stator housing;

said hook engaging behind said inwardly extending projection for locking; and

an actuating arm carried by said angle lever generally perpendicular thereto which extends into the path of movement of said magnetic core.

4,227,826

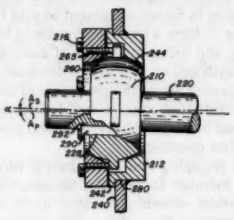
HUB-LOCKING DEVICE

Rene A. Conrad, Woodside, Calif., assignor to Dynaloc Corporation, San Mateo, Calif.

Continuation-in-part of Ser. No. 801,164, May 27, 1977, Pat. No. 4,140,413. This application Feb. 16, 1979, Ser. No. 13,187

Int. Cl.² B25G *3/20*

U.S. Cl. 403—371 **6 Claims**



1. A hub-locking device for use in coaxially mounting each end of a cylindrical pulley to a shaft comprising:

a collet having a generally spherically-shaped outer surface, a centrally located shaft receiving bore, a longitudinally extending slot passing through one side of said collet permitting compression of said collet around the shaft, and at least one radially extending lug;

a hub for attachment to an end of the cylindrical pulley to be mounted and having a first axially tapered bore for receiving one axial extremity of said collet, said hub having a plurality of bolt-receiving tapped bores and at least one lug-receiving recess formed therein;

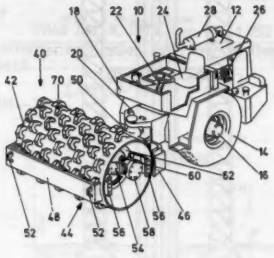
a clamping ring having a second axially tapered bore for receiving an opposite axial extremity of said collet, said ring having a plurality of bolt-receiving bores formed therethrough; and

bolt means passing through said bolt-receiving bores in said clamping ring for threading into said tapped bores to draw said clamping ring towards said hub to position said lug within said recess and to compress said collet into locking engagement with the shaft passing therethrough, said lug serving to prevent rotation of said collet with respect to said hub.

4,227,827
VIBRATORY COMPACTING ROLLER

Bruno Arenz, Düsseldorf, Fed. Rep. of Germany, assignor to Losenhausen Maschinenbau AG, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,873
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739338
Int. Cl.² E01C *19/26*
U.S. Cl. 404—121 **1 Claim**

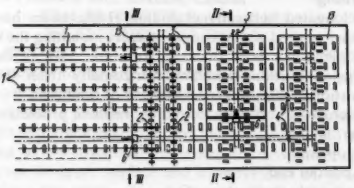


1. A roller drum, for compacting rollers, said roller drum comprising:
a cylindrical roller; and
a plurality of substantially trapezoidal shaped tamping elements disposed about an outer cylindrical surface of said roller, each of said tamping elements having disposed therein a recess open towards said outer cylindrical surface;
wherein said trapezoidal shaped tamping elements include:
a ground engaging side;
a base including two stems having curved end faces adapted to the curvature of the outer cylindrical surface of the roller, said base being longer than said ground engaging side and spaced radially inward from said ground engaging side; and
two legs of substantially equal length joining said ground engaging side and base; and
wherein an acute edge formed at a joint line between one of said legs and one of said curved end faces is cut off to form a truncated edge face.

4,227,828
BUILDING BERTH VESSEL SUPPORT AND HANDLING SYSTEM

Jury P. Ivanov, Grazhdansky prospekt, 92/2, kv. 1, and Evgeny A. Evstafiev, ulitsa Karpinskogo, 31, korpus 1, kv. 139, both of Leningrad, U.S.S.R.

Filed Jun. 1, 1978, Ser. No. 911,537
Claims priority, application U.S.S.R., Jun. 1, 1977, 2492490[I]
Int. Cl.² B63C *5/05*
U.S. Cl. 405—1 **9 Claims**

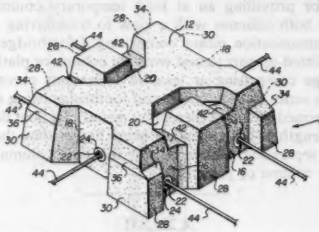


1. A building berth vessel support and handling system comprising:
a first plurality of keel blocks arranged in longitudinal rows for supporting a vessel as the vessel is moved in a longitudinal direction, said first plurality of keel blocks having support pads for supporting the vessel, said support pads being movable between raised and lowered positions;
a second plurality of keel blocks arranged in transverse rows for supporting a vessel as the vessel is moved in a transverse direction, said second plurality of keel blocks having support pads for supporting the vessel, said support pads being movable between first and second positions, the first positions being lower than the raised positions and the second positions being higher than the lowered positions of said support pads of said first plurality of keel blocks; and
each of said first and second plurality of keel blocks comprising:
a support positionable on a floor of a building berth;
a lifting mechanism installed in said support for raising and lowering said support pad;
a housing resting on said lifting mechanism and accommodating said support pad, said housing being movable by said lifting mechanism to raise and lower said support pad, the support pads of said first plurality of keel blocks being positionable in said raised positions, and the support pads of said second plurality of keel blocks being positionable in said first lower positions to facilitate longitudinal movement of a vessel, and the support pads of said first plurality of keel blocks being positionable in said lowered positions, and the support pads of said second plurality of keel blocks being positionable in said second higher positions to facilitate transverse movement of a vessel.

4,227,829
SOIL EROSION PREVENTION BLOCKS

Kossuth J. Landry, Jr., P.O. Box 2581, Lafayette, La. 70502

Filed Nov. 29, 1978, Ser. No. 964,598
Int. Cl.² E02B *3/12*; F02D *17/20*
U.S. Cl. 405—20 **15 Claims**



1. A device for positioning upon a surface for controlling the erosion of soil therefrom, said device comprising a block having:
(a) an upper surface
(b) a lower surface
(c) a plurality of side surfaces, said block defining:
(1) a plurality of first passageways connecting said upper and lower surfaces for permitting soil and foliage to pass through said block to retain said block in position and prevent erosion of the soil, and
(2) a plurality of second passageways connecting opposite side surfaces for permitting a cable or the like to pass through said block for retaining said block in position during transporting, installation and while said block is in position as a soil erosion controlling device each of said second passageways including a tunnel therein of reinforcing material for imparting structural reinforcement to said second passageway and to said block, and
(d) at least one cable or the like passing through said second

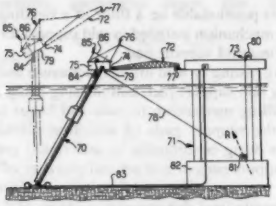
passageway, said cable being anchored at at least one end thereof into the surface below said block, once said block is in position, to retain said block in position.

4,227,830

ANCILLARY OFF-SHORE COLUMN LOCATED NEAR A SEA-BED WORKING COLUMN OR PLATFORM

Samuel Tuson, Mesnil-le-Roi, France, assignor to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H., France

Filed Jun. 23, 1978, Ser. No. 918,686
Claims priority, application France, Jun. 30, 1977, 77 20164
Int. Cl.[2] E02D *21/00*
U.S. Cl. 405—195 **18 Claims**



1. An auxiliary off-shore column located near a working column or platform for sea-bed exploitation, said auxiliary column being pivotally connected with its submerged lower part to a base member resting on the sea bottom whereas its emerged upper part comprises preferably at its top a landing area for instance for helicopters, said submerged lower part comprising a main float for keeping said auxiliary column in an at least approximately vertical position, wherein the improvement consists in that said auxiliary column is fitted up at least in part between its top and the main float with dwelling rooms, living quarters or like accommodation facilities for the staff on duty on said working column or platform and in that there are means for providing an at least temporary communication between both columns with a view to transferring said staff, said communication means comprising a footbridge connecting said fitted-up part to said working column or platform, said footbridge comprising at least two elements pivotally connected in series to each other, said footbridge being supported at an intermediate point thereof by means of a float device, the overall length of both elements being higher than the greatest distance separating, at its level, the dwelling column from the working column or platform.

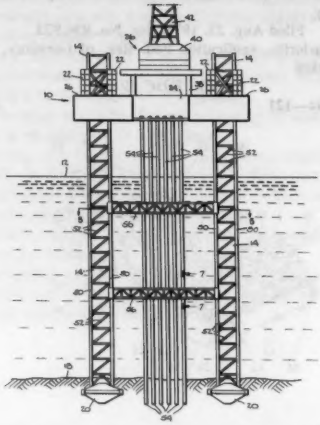
4,227,831

SELF-CONTAINED OFFSHORE PLATFORM

Darrell L. Evans, Spring, Tex., assignor to Raymond International Builders, Inc., Houston, Tex.

Filed Apr. 4, 1978, Ser. No. 893,432
Int. Cl.[2] E21B *15/02*
U.S. Cl. 405—196 **15 Claims**

1. An offshore platform structure comprising a barge-like flotatable hull, a plurality of support legs mounted on said hull to move up and down with respect to said hull, jacking mechanisms interconnecting said hull and said legs to lift said legs up from the sea bottom for floating said hull to a desired offshore location, to lower said legs down to the sea bottom at said desired offshore location and to lift the hull up above the sea surface onto the thus lowered legs, said hull being formed with an opening located between two of said legs for accommodating elongated conductors extending down from a drilling tower mounted on said hull over said opening, at least one conductor support extending between said two legs under said hull, said conductor support being formed with guide sleeves in alignment with said opening to guide and give lateral support to said conductors, said conductor support including leg engaging means at each end thereof for holding said conductor support to said two legs, said leg engaging means being formed and constructed to allow said conductor support to move up and down freely along said two legs while being guided



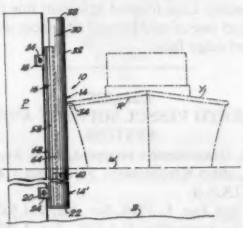
thereby, releaseable means for holding the conductor support to the underside of the hull, and selectively lockable means for locking said conductor support against up and down movement on said legs.

4,227,832

DOCKSIDE PROTECTIVE DEVICE FOR BOATS

Anthony J. Leone, 3301 Raleigh St., Hollywood, Fla. 33021; Raymond A. Leone, 4891 SW. 36 Ct., Pembroke Park, Fla. 33023, and James Long, 10120 Torchwood Ave., Plantation, Fla. 33024

Filed May 23, 1978, Ser. No. 908,642
Int. Cl.[3] E02B *3/22*
U.S. Cl. 405—215 **12 Claims**



1. For attachment relative to a vertical member such as a piling in a boat docking area, a protective device for boats comprising:

an elongated vertically extending H-like beam having an inner portion with means for fixedly mounting the beam to a piling-like boat docking structure, and an outer T-shaped portion extending horizontally from the inner portion along the vertical length of the beam,

an elongated vertically extending, resilient protective member having

a top end,

a bottom end,

an outside abutment surface,

a T-shaped inner wall vertically extending from the top end to the bottom end of the protective member, the T-shaped inner wall defining a seam, the seam being distended and enlarged at both ends of the protective

member defining distorted T-shaped openings, and gripper means for gripping the outer T-shaped portion of the H-beam, and means for supporting and positioning the protective member on the beam.

4,227,833

MINERAL MINING INSTALLATION

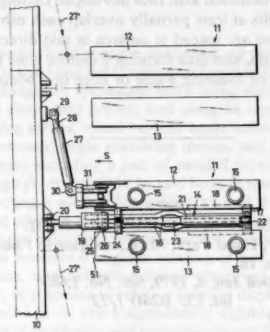
Karl-Heinz Plester, Lunen, and Friedrich Eggenstein, Bergkamen-Oberaden, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,652

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800619

Int. Cl.[2] E21D *23/00*

U.S. Cl. 405—299 **12 Claims**



1. In a mineral mining installation including a longwall structure and a roof support unit, the roof support unit being provided with a substantially horizontal, hydraulic bracing ram disposed at an acute angle to the longwall structure and acting on said structure to brace said structure longitudinally, the bracing ram being pivotally attached to a floor sill of the roof support unit by connection means, the improvement characterized by:

the connection means comprising a bracket slidably mounted on an end of the floor sill adjacent to said longwall structure for movement towards and away from said structure, and means for securing the bracket to the floor sill in any one of a plurality of positions to enable the angular position of the bracing ram to be maintained substantially constant when the distance between the roof support unit and the longwall structure is changed.

4,227,834

BLOCK LAYING MACHINE

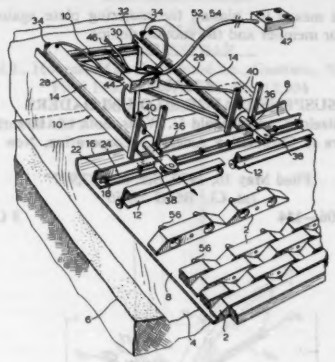
Robert E. Crowe, Milton, Canada, assignor to Terrafix Erosion Control Products, Inc., Rexdale, Canada

Filed Jan. 16, 1979, Ser. No. 3,876

Int. Cl.[3] E01C *19/52*; E02B *3/12*

U.S. Cl. 405—303 **6 Claims**

1. A machine for laying interlocking blocks on a prepared surface comprising a thin, flexible, rectangular apron upon which successive courses of blocks may be laid extending parallel to and commencing at one marginal edge, said apron presenting a low frictional resistance to movement of the blocks over its upper surface and to movement of its lower surface over the prepared surface, a frame connected to a second marginal edge of the apron opposite said one marginal edge, at least two laterally spaced pusher bars overlying the apron and extending substantially parallel to said marginal edges, each pusher bar being engageable with a different part of the same course of blocks, a retractable actuator acting between each pusher bar and the frame and operable so as to



push its associated bar and the frame apart, and means for operating each of said actuators independently.

4,227,835

APPARATUS FOR THE METERED SUPPLY OF POWDER TO A POWDER PROCESSING UNIT

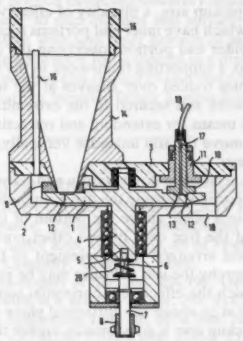
Herbert Nussbaum, Geroldswil, Switzerland, assignor to Plasmainvent AG, Zug, Switzerland

Filed Feb. 21, 1979, Ser. No. 13,274

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1978, 2807866

Int. Cl.[3] B65G *53/48*

U.S. Cl. 406—52 **13 Claims**



1. Apparatus for the metered supply of powder to a powder unit, the apparatus comprising:

a rotatable metering plate,

a circularly extending powder groove in the metering plate,

a powder container located above the groove,

an outlet from the powder container to the groove, and

a suction device, for removing powder from the metering plate, provided above the powder groove and extending into the powder groove, wherein

a doctor member is positioned around the outlet of the powder container, is supported on both sides of the powder groove and its rear end, and has a chamfer in the lower surface in the region of the container outlet,

the suction device being supported on both sides of the powder groove and comprising a suction bore and a crescent-shaped projection behind the suction bore, said projection extending into the powder groove as far as the

bottom surface thereof, the concave end face of said crescent-shaped projection directed towards the suction bore, and

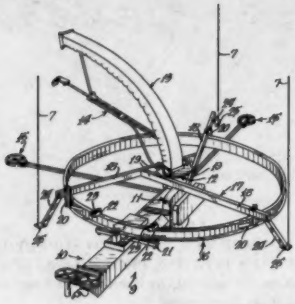
resilient means for biasing the metering plate against the doctor member and the suction device.

4,227,836

SUSPENSION FOR SILO UNLOADERS

Cary L. Sizelove, and Donald G. Wells, both of Harvard, Ill., assignors to Chromalloy American Corporation, New York, N.Y.

Filed May 10, 1979, Ser. No. 37,907
Int. Cl.³ B65G *53/50*
U.S. Cl. 406—114 **5 Claims**



1. In a silo unloader of the type which includes a cutter-conveyor pickup arm, an impeller to receive silage from the pickup arm and discharge it from the silo, a drive ring generally concentric with the impeller, one side of said drive ring overlying the pickup arm, a plurality of effectively horizontal support arms which have inner end portions secured above the impeller and outer end portions overlying the drive ring and secured thereto, a supporting framework in the top of the silo, suspension cables trained over sheaves at the top of the supporting framework and secured to the extremities of the support arms, and means for extending and retracting the suspension cables to move the silo unloader vertically, the improvement comprising:

said support arms have downwardly and outwardly extending offset portions outside the drive ring which have their free ends in a plane above the bottom of the cutter-conveyor, and the free ends of said offset portions are constructed and arranged for securement of the suspension cables, whereby the silo unloader may be raised to a position in which the effectively horizontal support arms are effectively at or above the horizontal plane of the sheaves and the pickup arm is substantially higher than the top of the silo wall.

4,227,837

ROUTER BIT

Shigeyasu Yodoshi, 6-22, Sakaemachi, Kawachinagano-shi, Osaka-fu, Japan

Filed Oct. 12, 1978, Ser. No. 950,619
Claims priority, application Japan, Mar. 9, 1978, 53-27207
Int. Cl.² B26D *1/12*
U.S. Cl. 407—53 **6 Claims**

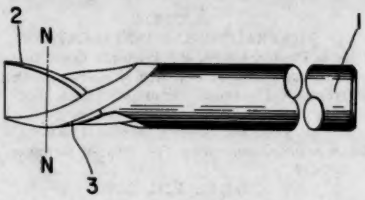
1. A router tool for use in chamfering or finishing a side or edge of a board, particularly a fiber reinforced plastic board, said router tool comprising:

an elongated body having a longitudinal rotational axis, a periphery, a free end and a shank end;

an even number of paired cutting edges formed in said periphery of said body adjacent said free end thereof;

said cutting edges of each said pair of cutting edges extending helically in opposite directions but at equal helical angles with respect to said rotational axis; and

said cutting edges being positioned such that when they are developed along a direction circumferentially of said body



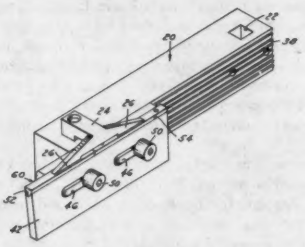
about said rotational axis, thus developed cutting edges of opposite helix at least partially overlap each other in said direction and are spaced at an area in said direction by a constant pitch, said area forming a cutting zone for use in chamfering or finishing a side or edge of a board.

4,227,838

GROOVING AND CUT-OFF TOOL

Robert W. Berry, Hazel Park, Mich., assignor to Fansteel Inc., North Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 1,683
Int. Cl.³ B26D *1/12*
U.S. Cl. 407—77 **2 Claims**



1. A cutting tool for holding relatively small replaceable inserts which comprises:

(a) a tool body to be held in a machine adjacent a workpiece having a flat face formed with parallel, elongate serrations,

(b) a holding plate on said body having serrations on one surface complemental to those on said body and having an exposed recess to receive a cutting insert,

(c) means on said body to retain said plate securely against said body in one of a plurality of adjusted positions,

(d) clamping means on said body shaped to overlie said exposed recess to clamp an insert in said recess,

(e) said clamping means comprising a portion to overlie said recess and a threaded portion received in one end of a recess in said body, a threaded insert in the other end of said body recess, and a double-threaded screw received in said threaded insert and said threaded portion to move said clamp toward and away from said body, and

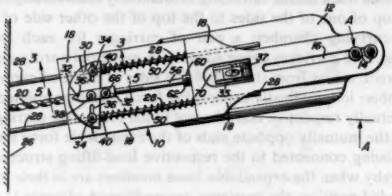
(f) said threaded insert in the other end of said body recess comprising a block having an out-of-round portion to be received in said recess and a portion to seat against said body.

4,227,839

ANGLE INDICATING ATTACHMENT FOR DRILLS

Ceil L. Conway, 2003 N. Brentwood, Essexville, Mich. 48732

Filed Nov. 29, 1978, Ser. No. 964,786
Int. Cl.[3] B23B *49/00, 39/00*
U.S. Cl. 408—16 10 Claims



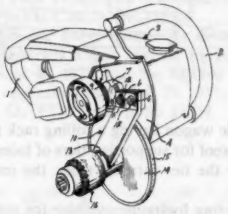
1. A device having angle indicating means for removable attachment to a hand held drilling tool comprising, in combination, an elongated, symmetric body being rigidly and removably held above said drilling tool along its longitudinal extent by attaching means, visual vertical angle indicating means and visual horizontal angle indicating means, said horizontal indicating means including a pair of parallel forwardly extending angle gauge pivot rods held by said body in spaced relationship for contacting a surface for drilling by said drilling tool, said rods being adapted to move freely in the longitudinal direction and to orient indicating means attached to said body for indicating the horizontal angular relation of said drilling tool to said surface, said indicating means comprises an angle gauge pivotable, in response to relative moving displacement of said rods, about a pivot axis longitudinally slidable in the plane of symmetry of said body, said indicating means further including an angle indicator fixed in angular position with respect to the longitudinal extent of said body for visual observation of the angle of pivoting of said angle gauge about said pivot axis wherein said horizontal and vertical angle indicating means permit continued visual observation during use of said drilling tool in drilling into a flat surface.

4,227,840

DRILLING ATTACHMENT FOR CHAIN SAW

Clovis Thivierge, R.R. No. 2, Drummondville, Quebec, Canada

Filed May 18, 1979, Ser. No. 40,190
Int. Cl.[3] B23B *43/00;* B27G *17/00*
U.S. Cl. 408—20 6 Claims



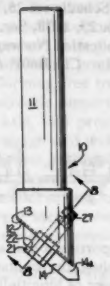
1. For a chain saw having a driving output shaft and a cutter bar connection device adjacent the driving output shaft, the invention comprising a drilling attachment including a first friction drive wheel securable on said driving output shaft for bodily rotation therewith, a mounting bracket rigidly securable to said cutter bar connection device, a second friction drive wheel rotatively carried by said mounting bracket and operatively frictionally engaging said first friction drive wheel and driven by the latter, and a drill chuck fixedly connected to the second friction drive wheel and bodily rotating with the latter in response to rotation of the first friction drive wheel in operative engagement with the second friction drive wheel.

4,227,841

BORING BAR

Donald L. Hoover, 4428 Coachwood La., Gastonia, N.C. 28052

Filed Feb. 15, 1979, Ser. No. 12,304
Int. Cl.[3] B23B *51/00*
U.S. Cl. 408—197 11 Claims



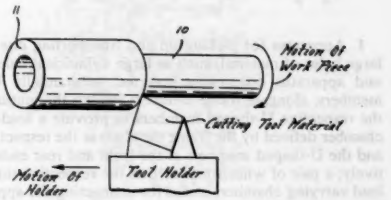
1. A boring bar comprising an elongate body having a free end provided with an end surface thereon inclined at an acute angle transversely of the longitudinal axis of said body, an elongate cutting member positioned against said inclined end surface, said inclined end surface having a recess extending inwardly therefrom, a yoke member positioned in said recess and having a portion extending outwardly beyond said inclined end surface and perpendicular thereto and surroundingly engaging said cutting member, said yoke member also having an inner portion extending inwardly beyond said recess and perpendicular to said inclined end surface, and securing means cooperating with said inner portion of said yoke member for applying an inward force thereto in a direction perpendicular to said inclined end surface of said body for clampingly securing said cutting member firmly against said inclined end surface.

4,227,842

METHOD OF USING $Si_3N_4.Y_2O_3.SIO_2$CERAMIC SYSTEM FOR MACHINING CAST IRON

Shyam K. Samanta, Ypsilanti; Krishnamoorthy Subramanian, Inkster, and Andre Ezis, Grosse Ile, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 954,796, Oct. 25, 1978, abandoned, which is a division of Ser. No. 911,256, May 31, 1978. This application Dec. 20, 1979, Ser. No. 105,829
Int. Cl.[3] B23C *1/00;* C04B *35/58, 35/50*
U.S. Cl. 409—131 5 Claims



1. A process for continuous or interrupted machine cutting of solid cast iron stock by milling, turning or boring with a shaped tool wherein said shaped tool is a ceramic consisting essentially of Si_3N_4 and 4–12% by weight Y_2O_3, produced by

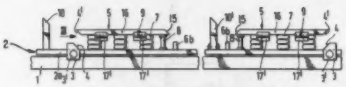
hot pressing at a predetermined pressure, said pressure being maintained continuously during heating at an ultimate pressing temperature of 1700°–1750° C. until a density of at least 3.25 g/cm^3 is obtained and shaping the hot pressed ceramic into a cutting tool.

4,227,843

DEVICE FOR COUPLING, TRANSPORTATION AND PLACING OF GOODS CONTAINERS

Sverre Damm, Anton Schudis vei 25, Oslo 5, Norway

Filed Feb. 23, 1978, Ser. No. 880,565
Claims priority, application Norway, Feb. 23, 1977, 770597
Int. Cl.^{3} B60P *1/64*
U.S. Cl. 410—54 **8 Claims**



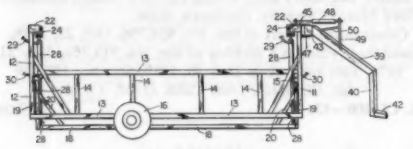
1. A device for supporting a container on a chassis (1) of a vehicle and for coupling the container to the chassis, said device comprising: a pair of longitudinal, substantially parallel beams (2) defining a basic frame linkable to said chassis (1), each longitudinal beam (2) of said pair having a sloped inside face (17), the inside faces (17) of the two beams (2) facing each other; cross-beams (3) mounted near end portions of said pair of beams (2), said cross-beams having facing sloped faces (4); at least two bridges (5), each bridge having a platform (5) which covers part of the space defined between said pair of longitudinal beams (2), each platform having at one of its ends a sloped lower face (4') complementary to the sloped face (4) of the cross-beam (3) to which it is adjacent, and each platform (5) having downwardly projecting side feet (9) with lower surfaces complementary sloped to said sloped faces (17) of the two longitudinal beams (2); lifting means (7) arranged below said platforms (5) for raising said bridges into contact with the bottoms of containers to be supported; and means for coupling a supported container with said device.

4,227,844

APPARATUS FOR LIFTING AND TRANSPORTING LARGE BALES OF MATERIAL

Phillip W. Love, P.O. Box 323, Smithville, Tenn. 37166

Filed Jan. 16, 1979, Ser. No. 3,984
Int. Cl.^{3} B60P *3/00*
U.S. Cl. 414—24.5 **6 Claims**



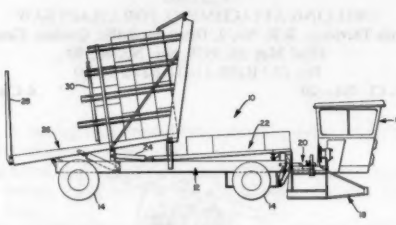
1. Apparatus for picking up and transporting one or more large bales of material, such as large cylindrical bales of hay, said apparatus comprising inverted, substantially U-shaped members; elongate frame members joining the mutual legs of the respective U-shaped members to provide a load-carrying chamber defined by the frame members at the respective sides, and the U-shaped members at the front and rear ends, respectively; a pair of wheels mounted at the respective sides of the load carrying chamber; means for connecting the apparatus to a motive vehicle; a pair of elongate, load-lifting structures pivotally attached to respective sides of the load-carrying chamber, said load-lifting structures comprising respective lowermost elongate lift members extending substantially the length of and substantially parallel to the respective sides of the load-carrying chamber, said lift members being pivotally attached to the respective sides of the load-carrying chamber by respective sets of arm members, so that the lift members can be moved in a swinging motion outwardly and upwardly from lowered positions adjacent to the lower sides of the load-carrying chamber to elevated positions extending outwardly from the respective sides and upwardly from the bottom of the load-carrying chamber and back to the lowered positions; at least one track means extending substantially transversely from the top of one of the sides to the top of the other side of the load-carrying chamber; a pair of carriages for each track means, said carriages being adapted to move outwardly along the track means from the respective sides of the load-carrying chamber; longitudinally expandable force members connected at mutually respective ends thereof to the respective carriages, with the mutually opposite ends of the expandable force members being connected to the respective load-lifting structures, whereby when the expandable force members are in their fully extended position, the carriages are positioned adjacent to the respective sides of the load-carrying chamber with the force members extending downwardly therefrom substantially alongside the respective sides of the load-carrying chamber, and when the expandable force members are shortened, the load-lifting structures move into their elevated position and the carriages move toward the center of the load-carrying chamber so as to maintain the expandable force members in substantially vertical position, thereby exerting maximum force on the load-lifting structure.

4,227,845

ROLLING RACK CONTROL FOR AUTOMATIC BALE WAGON

Richard A. Colby, Fresno; Leo B. Parolini, Manford, and L. Dennis Butler, Kingsburg, all of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 14, 1978, Ser. No. 933,234
Int. Cl.^{2} A01D *87/12*; B65G *57/32*
U.S. Cl. 414—39 **6 Claims**



1. In a bale wagon having a rolling rack movable along the load bed thereof for supporting tiers of bales deposited on said load bed by the tier forming table, the improvement which comprises:

a single acting hydraulic cylinder for positively advancing said rolling rack to a first position,

means for selectively connecting said hydraulic cylinder with a source of hydraulic fluid under pressure for extending said hydraulic cylinder and including a fluid flow line,

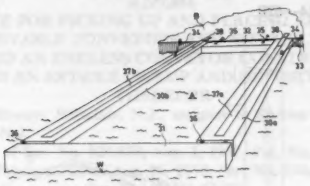
oscillator means connected with said fluid flow line for selective intermittent release of fluid pressure from said fluid flow line so that when mechanical pressure is exerted against said hydraulic cylinder in such a manner as to urge retraction of said hydraulic cylinder, such retraction may be controlled by intermittent release of pressure from said fluid flow line.

4,227,846

METHOD AND APPARATUS FOR LOADING OR UNLOADING WATER VESSELS

Veikko Koskivirta, Vantaa, Finland, assignor to Valmet Oy, Finbaal, Finland

Filed Jun. 7, 1978, Ser. No. 913,483
Int. Cl.[3] B65G 67/58
U.S. Cl. 414—139 4 Claims



1. Apparatus for transporting cargo between a water vessel and a quay comprising:

a pair of elongate substantially parallel pontoon members extending substantially perpendicularly to the edge of said quay, said pontoon members being spaced from each other so as to define an area between them for accommodating at least one water vessel and wherein each pontoon member has a first end proximate to the quay edge and a second distal end and track means extending over the substantial length thereof between said first and second ends;

mobile crane apparatus including a pair of carriage assemblies, each of said carriage assemblies being supported for movement on said track means of a respective one of said pontoon members, a beam member having end portions affixed to respective ones of said carriage assemblies, said beam member extending substantially horizontally over the vessel accommodating area, and means associated with said beam member for engaging and supporting the cargo;

ramp means extending between and interconnecting the first end of each of said pontoon members and the quay; and

means for adjusting the height of said track means relative to the quay for substantially aligning said track means with the surface of said quay;

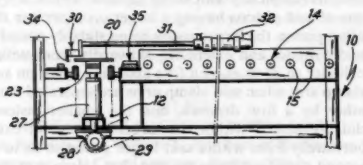
whereby said crane apparatus can be moved between said pontoon members and quay over said ramp means.

4,227,847

APPARATUS FOR LOADING OVENS FOR THE PRODUCTION OF TILES

Renato Bossetti, Novara, Italy, assignor to Societa' Impianti Termoelettrici Industriali (s.a.s.), Marano Ticino, Italy

Filed Jul. 28, 1978, Ser. No. 929,293
Claims priority, application Italy, Jul. 28, 1977, 26235 A/77
Int. Cl.[3] F27B 9/02; B65G 47/54
U.S. Cl. 414—152 5 Claims



1. A loading apparatus for loading tiles to be fired into each tile treatment and/or firing chamber of an oven, wherein the tiles travel parallel to the longitudinal axis of a chamber at a linear processing speed, said apparatus comprising:

spaced belt means for feeding tiles to be fired in a direction perpendicular to said longitudinal axis;

stop means positioned adjacent said belt means for stopping the progress of said tiles in said direction and for forming said tiles into a file on said belt means;

vertically movable support means, vertically displaceable between a lowermost position and an uppermost position, for, during movement from said lowermost to said uppermost positions thereof, engaging undersides of said tiles of said file of tiles and for lifting said file of tiles above the level of said belt means, said support means comprising a movable support member having extending upwardly from an upper portion thereof projections separated and defined by recesses forming free transverse passages extending across said movable support member and parallel to said longitudinal axis, said projections having upper surfaces adapted to engage said undersides of said tiles;

conveyor means, positioned adjacent said belt means and said movable support means, for conveying said file of tiles in a direction parallel to said longitudinal axis to the chamber, said conveyor means comprising a plurality of rollers having axes extending perpendicular to said longitudinal axis; and

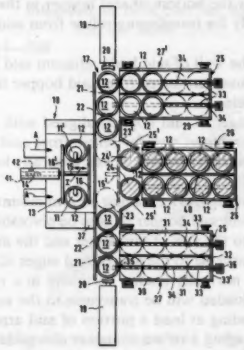
means for removing said file of tiles from said movable support member and for transferring the thus removed file of tiles to said conveyor means, said removing means comprising a thruster member mounted for horizontal displacement in directions parallel to said longitudinal axis, said thruster member including a plurality of fingers for engaging sides of said tiles of said file of tiles, said fingers being positioned and dimensioned such that when said movable support member is in said uppermost position thereof said fingers register with said free passages of said movable support member and contact said sides of said tiles over substantially the entire thickness of said tiles.

4,227,848

CAN CHANGING DEVICE

Kurt Kriechbaum, Ebersbach; Hans Kienhofer, Rechberghausen, and Rin J. Picht, Hochdorf, all of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 728,063, Sep. 30, 1976, abandoned. This application Jan. 12, 1979, Ser. No. 3,313
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1975, 2543621
Int. Cl.[3] B65G 67/00
U.S. Cl. 414—395 13 Claims



1. A can changing apparatus for a silver collecting machine wherein the operation of loading and unloading stations is exchangeable comprising:

means defining a filling station for supporting silver cans in a position to be filled;

a straight conveyor path slightly wider than the silver can diameter extending parallel to said filling station;

means defining an intermediate station for temporary storage of full cans on the other side of said path from said filling station as they are removed from the conveyor path;

first conveyor means for advancing empty cans along said path and into position directly in front of said filling station;

full-can receiving cart means positioned adjacent and on the opposite side of said intermediate station from said path;

rotatable second conveyor means at said filling station for moving filled cans first from said filling station to said path, next through said path to said intermediate station and then onto said full-can receiving cart means, and for moving empty cans from said path to said filling station;

third conveyor means associated with said empty-can cart means for transferring empty cans from said empty-can cart means to said straight conveyor path, all of said conveyor means operated in timed relation to each other.

4,227,849

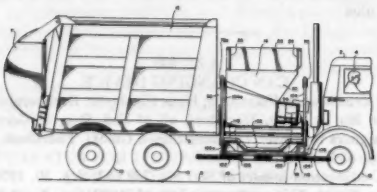
REFUSE COLLECTION DEVICE

Wayne H. Worthington, 720 Prospect Blvd., Waterloo, Iowa 50701, assignor to Wayne H. Worthington, Waterloo, Iowa

Continuation-in-part of Ser. No. 873,048, Jan. 27, 1978, abandoned. This application May 24, 1978, Ser. No. 908,811

Int. Cl.³ B65F *3/02*

U.S. Cl. 414—408 **14 Claims**



1. A side loading refuse collection vehicle comprising:

a refuse receiving body;

a hopper disposed adjacent said body and open at the top to receive refuse;

an opening near the bottom of said hopper in the wall adjacent said body for transferring refuse from said hopper to said body;

an opening in the wall of said body adjacent said hopper for receiving refuse transferred from said hopper through the opening therein;

a screw-type auger in said hopper, aligned with said openings, and operable to transfer refuse from said hopper to said body, said auger having its axis generally longitudinal of the vehicle;

a side loading lifting device having an arm mounted on said vehicle adjacent said hopper so as to be pivotable about an axis parallel to the axis of said auger and the arm located generally transverse to the axis of said auger so that elongate articles, normally loaded vertically in a refuse container when loaded will be transverse to the auger axis;

means for extending at least a portion of said arm for automatically engaging a refuse container alongside said vehicle; and

means for operating said lifting device to raise the container over the hopper and auger and dump the contents of said container into said hopper.

4,227,850

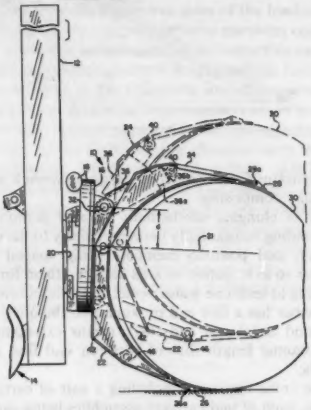
LIFT TRUCK LOAD CLAMP FOR HANDLING PAPER ROLLS

Stanley E. Farmer, Troutdale, and Harry F. Weinert, Portland, both of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 834,107, Sep. 19, 1977, Pat. No. 4,127,205. This application Oct. 20, 1978, Ser. No. 953,093

Int. Cl.³ B66F *9/18*

U.S. Cl. 414—620 **2 Claims**



1. A load-handling clamp adapted to be mounted upon the lifting apparatus at the forward end of a lift truck for engaging a cylindrical roll of paper and the like, comprising:

(a) a frame adapted to be mounted upon said lifting apparatus so as to be selectively movable vertically by said lifting apparatus;

(b) first and second selectively openable and closable opposing clamp arms mounted upon said frame projecting therefrom in a forward direction, each of said first and second clamp arms having a forward end and a rear end respectively;

(c) pivotal clamp arm connection means for interconnecting the rear end of said first clamp arm with said frame for permitting said first clamp arm to pivot with respect to said frame selectively toward or away from said second clamp arm;

(d) power means for pivoting said first clamp arm selectively toward or away from said second clamp arm, said power means including selectively extensible and retractable piston and cylinder assembly means pivotally interconnected with said first clamp arm and extending generally rearwardly therefrom toward said frame for causing said first clamp arm to pivot toward said second clamp arm upon extension of said piston and cylinder assembly means;

(e) said piston and cylinder assembly means including at least two telescopically extending pistons within a cylinder, one of said pistons having a larger cross section than the other piston, the larger piston being slidably nested within said cylinder and extensible outwardly from within said cylinder so as to exert a first clamping force on said first clamp arm when said clamp arms are separated from each other by a first distance, and the smaller piston being slidably nested within the larger piston and extensible outwardly from within said larger piston so as to exert a second clamping force on said first clamp arm which is less than said first clamping force when said larger piston is fully extended outwardly from within said cylinder and said clamp arms are separated from each other by a second distance which is less than said first distance, said larger piston having means defining a fluid passageway therein

extensible outwardly from within said cylinder in unison with said larger piston for conducting fluid under pressure to said smaller piston for retracting said smaller piston within said larger piston;

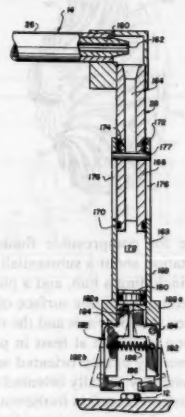
(f) said first clamp arm having means defining an enclosure therein and said piston and cylinder assembly means being enclosed at least partially within said enclosure.

4,227,851

DEVICE FOR PICKING UP AND PLACING ARTICLES ON MOVABLE CONVEYORS AND ASSEMBLY LINES AND TO AN ENDLESS CONVEYOR CONSTRUCTION AND TO AN ARTICLE PICKUP AND DEPOSIT DEVICE THEREFOR

Earl F. Beezer, Hillsdale, N.J., assignor to Stelron Cam Company, N.J.

Division of Ser. No. 820,833, Aug. 1, 1977, Pat. No. 4,166,527.
This application Aug. 18, 1978, Ser. No. 934,888
Int. Cl.³ B65G *47/90*
U.S. Cl. 414—626 **5 Claims**



1. A fluid pressure operated device for picking up and dropping articles, comprising a first tubular member having a pressure supply connection at one end to the bore thereof, a sleeve engaged over said first tubular member, said sleeve having a longitudinally elongated slot on each side of the wall thereof, a pin extending through said first tubular member and slidably engaging said slots on respective sides of said sleeve member, a pressure release opening in said first tubular member closed by said sleeve in an operative position but being operable by said slot when said slot is moved to a position overlying said opening, a piston in sliding sealing engagement within the interior of said sleeve below said first tubular member, first and second article gripping means disposed below said piston and being movably mounted on said sleeve adjacent the lower end thereof, each gripper member being displaceable by movement of said piston due to actuation of pressure in said first tubular member, the displacement of said gripper members being controlled by the pressure acting on said piston, and spring means for returning said gripper members to a non-actuated position.

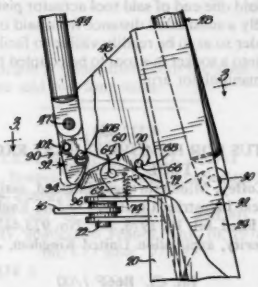
4,227,852

RELEASABLE BACKHOE BOOM LOCK

Floyd A. Schmitz, and William F. Joy, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 23, 1979, Ser. No. 5,769
Int. Cl.³ E02F *3/32*
U.S. Cl. 414—694 **4 Claims**

1. In an earthworking implement having one end of a boom pivoted on a swing tower between transport and working positions and a dipper assembly including a member having an intermediate portion pivoted on said boom at a location spaced from the swing tower and boom pivot, said dipper assembly being pivoted on said boom by a fluid ram having a first element pivoted on said boom and a second element pivoted on one end of said intermediate member and movable between fully extended and retracted positions respectively defining a transport position and a maximum extended position of an opposite end of said dipper assembly with respect to said boom, and releasable lock means between said boom and said swing tower, said releasable lock means including a latch pivoted on said swing tower between first and second positions, said latch having a recess adjacent one end thereof, pin



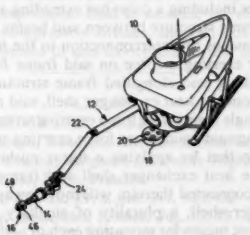
means carried by said boom and adapted to be received in said recess and positioned so that movement of said boom to said transport position will produce engagement between said latch and said pin means to cause said latch to be pivoted from said first position to said second position until said recess is aligned with said pin means and have said pin means received into said recess, and unlatching means for pivoting said latch between said positions to release said latch, said unlatching means including an extension on said first element, said extension being aligned with said latch to engage and release said latch when said boom is in said transport position and said fluid ram is moved from said fully extended position toward said retracted position.

4,227,853

MANIPULATOR WRIST TOOL INTERFACE

Alan T. Woodford, Owen Sound, Canada, and Michel R. Horellou, Bordeaux, France, assignors to Spar Aerospace Limited, Toronto, Canada

Filed Feb. 6, 1979, Ser. No. 9,847
Int. Cl.³ B66C *3/16*
U.S. Cl. 414—738 **3 Claims**



1. A coupler for connecting a tool body and its associated tool actuator linkage to a manipulator arm of a remote manipulator device comprising:

(a) a tool holder adapted to be secured to the manipulator arm, first latching means on the tool holder at one end

thereof for releasably securing a tool body with respect to said tool holder;

(b) a tool actuator piston mounted in a first cylinder located within said tool holder, said tool actuator piston having second latching means at one end thereof for releasably securing a tool actuator arm thereto, said second latching means being located at said one end of said tool holder inwardly from said first latching means, said first cylinder being connectable to a source of pressurized fluid whereby said tool actuator piston may be reciprocally driven with respect to said tool holder in response to variations in fluid pressure in said first cylinder between an extended position and the retracted position to provide a drive force for driving a tool actuator of a tool held fast with respect to said tool holder by said first latching means, said one end of said tool actuator piston projecting outwardly a substantial distance from said one end of said tool holder so as to be readily visible to facilitate insertion thereof into a socket in a tool to be coupled by the coupler to said manipulator arm.

4,227,854

APPARATUS FOR REMOVING HEAT EXCHANGER TUBE BUNDLES

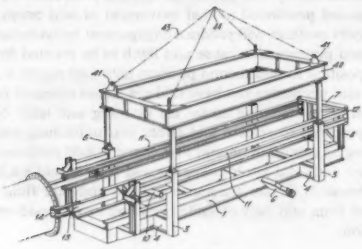
William A. Coffey, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 10, 1978, Ser. No. 923,443

Claims priority, application United Kingdom, Jul. 11, 1977, 28985/77

Int. Cl.³ B66F *1/00*

U.S. Cl. 414—746 **11 Claims**



1. Apparatus for moving a tube bundle out of or into a heat exchanger shell, comprising

an elongated frame structure including a pair of parallel spaced beams;

a mobile carriage, for supporting the tube bundle, mounted on said beams for movement therealong;

means for connecting and locking said elongated frame structure to the shell of the heat exchanger;

a frame movable along the length of said elongated frame structure including a cross-bar extending across said elongated frame structure between said beams, and said frame having means for interconnection to the tube bundle;

means for exerting a force on said frame for moving said frame along said elongated frame structure toward and away from the heat exchanger shell, said means comprising: a single main linear force exerting structure; means for mounting said main linear force exerting structure to said frame so that by applying a linear pushing force away from the heat exchanger shell said frame, and the tube bundle connected thereto, will move away from the heat exchanger shell; a plurality of auxiliary force exerting structures; means for mounting each of said auxiliary force exerting structures directly to said means for mounting said main force exerting structure, and to said cross-bar, so that said auxiliary structures are directed opposite to said main structure; and

a plurality of lateral thrust surfaces spaced apart along the length of said elongated frame structure to present opposing thrust surfaces to said auxiliary force exerting structures, and having a first mode of operation in which linear movement of said frame away from the heat exchanger shell is allowed, but movement toward the heat exchanger shell is prevented, and a second mode of operation in which linear movement of said frame toward the heat exchanger shell is allowed but movement away from the heat exchanger shell is prevented.

4,227,855

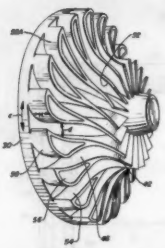
TURBOMACHINE

Patrick F. Flynn; Harold G. Weber, and John M. Mulloy, all of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 25, 1978, Ser. No. 936,695

Int. Cl.³ F04D *29/28*

U.S. Cl. 415—215 **15 Claims**



1. A turbomachine for compressible fluids comprising a rotor mounted for rotation about a substantially central transverse axis, said rotor including a hub, and a plurality of vanes mounted on and projecting from one surface of said hub, each vane extending between the rotor axis and the rotor periphery, adjacent vanes coacting to define at least in part a fluid passageway having a generally axially oriented section adjacent the rotor axis and a generally radially oriented section extending from said axially oriented section to the rotor periphery; a predetermined number of passageways each having a reference station provided with a generally tangentially oriented constriction and disposed within the radially oriented section thereof, the passageway configuration at said reference station having a mean tangential dimension that is no more than about 60% of the mean circumference of the rotor measured at said reference station divided by the number of vanes intersecting said circumference.

4,227,856

REVERSE VELOCITY ROTOR SYSTEM FOR ROTORCRAFT

Thomas D. Verrill, Farmingdale, and John R. Ewans, Shirley, both of N.Y., assignors to The United States of Ameria as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 12, 1978, Ser. No. 924,101

Int. Cl.³ B64C *11/30, 27/32*

U.S. Cl. 416—1 **6 Claims**

2. A system for providing twice-per-revolution or higher harmonic blade pitch control of a helicopter rotor having a rotor hub and a plurality of blades connected thereto for pitch changing movements relative thereto comprising:

a hollow drive shaft attached to said rotor hub and drive means for rotating said shaft,

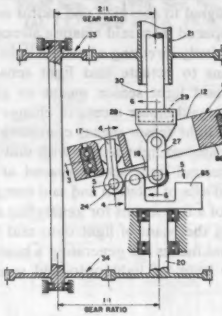
a pitch control column received in said shaft and linkage means connecting said column and said blades for imparting pitch movement to said blades;

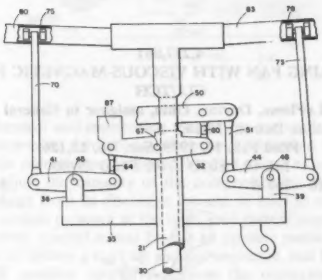
rotatable support means for supporting said column and a swashplate mounted between said rotatable support means

and said column for transmitting oscillatory motion thereto upon tilting of said swashplate;

means for tilting said swashplate; and

means connecting said drive shaft and said rotatable support means for rotating said swashplate at at least twice the rate





of revolution of said drive shaft, p1 said linkage means including a crosshead at the upper end of said column and said drive shaft having a vertical slot for slidably receiving said crosshead whereby once-per-revolution pitch motion and said at least twice-per-revolution motion are mixed and operate to increase rotor thrust.

4,227,857

COMPOSITE FLEXURAL YOKE FOR HELICOPTERS

Peter A. Reyes, Watauga, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 19, 1977, Ser. No. 826,111

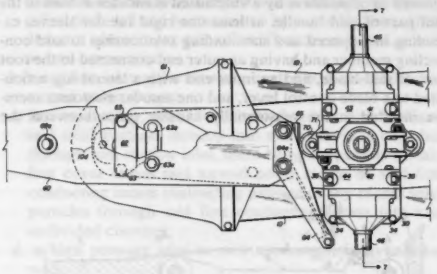
Int. Cl.[2] B64C *27/36*

U.S. Cl. 416—134 A **5 Claims**

1. An improved composite all fiberglas yoke for coupling helicopter blades to a rotatable mast, comprising:

an elongate loop of glass fibers defining a longitudinal axis, with two long sides of the loop extending parallel to the longitudinal axis; and

a plurality of layers of bias ply glass fibers intersticed between the fibers of said loop of glass fibers and arranged in planes parallel to the longitudinal axis of said loop along said long sides of the loop, said plurality of layers of bias ply glass fibers and said elongate loop of glass fibers being embedded in a cured adhesive to form a unitary structure and defining means for coupling said yoke to said rotatable mast substantially intermediate said two long sides



whereby torque is transmitted from the shaft to the yoke intermediate said two long sides.

4,227,858

FLEXIBLE SPHERICAL JOINT

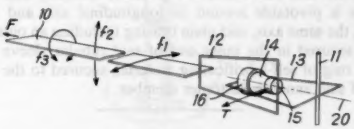
Paul J. Donguy, Bruges, France, assignor to Societe Europeenne de Propulsion, Puteaux, France

Filed Nov. 10, 1977, Ser. No. 850,301

Claims priority, application France, Nov. 10, 1976, 76 34009

Int. Cl.[3] B64C *27/38*

U.S. Cl. 416—134 A **7 Claims**



1. A spherical bearing for connecting a helicopter rotor hub to a rotor blade comprising:

a first and a second end piece connected respectively to the opposite ends of a stack, said first and second end pieces each having respective first and second spherical surfaces which are concentrically arranged,

said stack including a plurality of interconnected first and second spherical layers, said first and second layers being arranged to alternate in said stack, said first layers being formed of resilient material, said second layers being formed of metallic material, said first and second layers having a common axis of symmetry and the opposite ends of said stack contacting said first and second spherical surfaces, and

at least one completely closed cavity formed centrally in said stack and extending between said end pieces and being free of said resilient material, said cavity being filled with an incompressible fluid to increase the resistance of said joint to compressive stresses, and said axis of symmetry being common to said cavity and to said stack.

4,227,859

ROTOR FOR A GYROPLANE

Michel J. Y. Gouzien, Bouc-Bel-Air, and Edwin Ortega, Marseilles, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jul. 10, 1978, Ser. No. 923,432

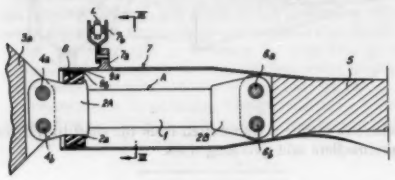
Claims priority, application France, Jul. 13, 1977, 77 21659

Int. Cl.[3] B64C *27/38*

U.S. Cl. 416—134 A **6 Claims**

1. A rotor, specially for a gyroplane, comprising a hub, at least one blade and one flexible elongate connecting member, interconnecting said blade and said hub, said connecting member comprising fibres having high mechanical strength and

relative elasticity and disposed in an elongate, substantially radial bundle, each fibre being agglomerated by a resin and secured to other fibres by a vulcanized elastomer at least in the mid part of said bundle, at least one rigid tubular sleeve, extending in a spaced and surrounding relationship to said connecting member and having an outer end connected to the root part of said blade, and an inner end with a lateral lug articulated to a blade control lever, and one annular elastomer member inserted in the substantially annular space between the



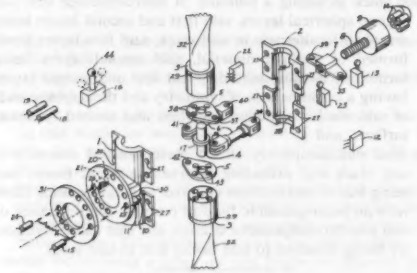
inner end of said sleeve and the inner end of said connecting member, said annular elastomer member having at least one recess adapted to reduce its rigidity in the axial direction of the rotor, a plain bearing between the inner end of said rigid tubular sleeve and said elastomer member, whereby said tubular sleeve is pivotable around its longitudinal axis and slidable along the same axis, said plain bearing including an outer metal ring, secured in the inner end of said tubular sleeve and an inner ring of self-lubrificating material, secured to the periphery of said annular elastomer member.

4,227,860

AIRCRAFT PROPELLER PITCH CONTROL

James R. Humphreys, P.O. Box 133 Victoria Station, Montreal, Canada (P.Q. H3Z-2V4)

Filed Apr. 24, 1978, Ser. No. 898,816
Int. Cl.[3] B64C *11/44*
U.S. Cl. 416—155 **5 Claims**



1. An apparatus for changing the pitch of a rotating aircraft propeller blade to selectively decrease the pitch of the blade to provide power for take-off or increase the pitch of the blade to increase speed, comprising:

an aircraft propeller blade positioned to rotate about an axis of rotation,

an aircraft propeller hub,

bearings connecting said propeller blade to said propeller hub that allow said blade to change pitch,

slide means connected to said aircraft propeller blade by rods for turning said blade on said bearings thereby changing the pitch of said blade, said slide means moveable axially along said axis of rotation,

motor means having a threaded drive shaft connected to said slide means for moving said slide means axially,

energy source means connected to said motor means for energizing said motor means,

light sensor means connected to said energy source means for generating a signal to energize said motor means, and

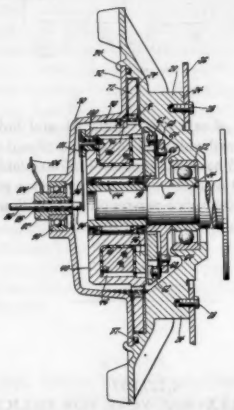
light source means spaced from said rotating aircraft propeller blade for selectively directing a beam of light onto said light sensor means to actuate said light sensor means thereby causing said light sensor means to generate a signal and energize said motor means to change the pitch of said blade, said light sensor means consisting of a first light sensor and a second light sensor with said first light sensor and said second light sensor spaced at different distances from said axis of rotation and said energy source means consisting of a first means for generating a beam of light and directing the beam of light onto said first light sensor and a second means for generating a beam of light and directing the beam of light onto said second light sensor.

4,227,861

COOLING FAN WITH VISCOUS-MAGNETIC FAN CLUTCH

Frank E. LaFlame, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 14, 1979, Ser. No. 12,156
Int. Cl.[3] F01D *7/08;* **F16D** *29/00*
U.S. Cl. 416—169 A **3 Claims**



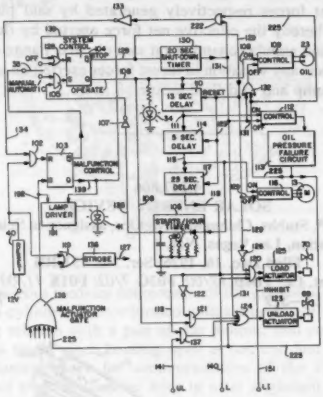
1. A fan drive comprising rotatable input shaft means, drive shoe means mounted on said shaft means for rotation therewith, drive plate means supported by said drive shoe means, a housing disposed around said input shaft means, bearing means supporting said housing for rotation on said input shaft means, selectively electrically energizable coil means disposed in said housing for attracting said drive plate means into driving engagement with said housing so that said housing will be driven by said input shaft means, fan body means rotatably mounted on said input shaft means around said housing, said fan body means having a fluid chamber therein, said housing having a rotor which extends into said chamber, said chamber having a hydraulic fluid therein effective on predetermined rotational drive of said rotor by said input shaft means to transmit drive torque for the hydraulic drive of said fan body.

4,227,862

SOLID STATE COMPRESSOR CONTROL SYSTEM

Eduardo V. Andrew, Liverpool, N.Y.; Robert A. Naunas, Jr., Fairfield, Pa., and Richard C. Armstrong, Jr., Inwood, W. Va., assignors to Frick Company, Waynesboro, Pa.

Filed Sep. 19, 1978, Ser. No. 943,887
Int. Cl.[3] F04B 49/06, 49/02, 49/10
U.S. Cl. 417—12 18 Claims



1. A control and monitoring system for connection with a fluid compressor driven by a motor and lubricated by an oil pump, the compressor including loading valve means operative to adjust the capacity of the compressor by modulating fluid leakage from its discharge toward its inlet to maintain a desired suction pressure at the inlet, said system comprising:

(a) system control means having an operate position operative to initiate a start-up and run sequence, and having an OFF position operative to stop the compressor drive motor and to initiate a shut-down and stop sequence;

(b) an oil pressure failure responsive circuit;

(c) a loading actuator and an unloading actuator, said actuators being connected to operate said loading valve means selectively and progressively to load or unload the compressor;

(d) first, second, and third delay means sequentially operative after the system control means is set to said operate position respectively to enable the pressure failure responsive circuit to check the oil pressure and reset the control means to OFF position in case of oil pressure failure, and operative to start the compressor drive motor, and operative thereafter to enable the compressor loading actuator; and

(e) a shut-down timer initiated when the system control means is reset to OFF position to energize the unloading actuator for an interval long enough to move the loading valve means to an unloaded position.

4,227,863

CENTRIFUGAL ASPIRATOR

Raymond Sommerer, 12221 N. 30th Ave., Phoenix, Ariz. 85029

Filed Sep. 18, 1978, Ser. No. 943,041
Int. Cl.[3] F04F 5/22
U.S. Cl. 417—169 6 Claims

1. An aspirator for aspirating a first fluid, said first fluid being mixed with solid particles having a higher specific gravity than said first fluid, said aspirator comprising in combination:

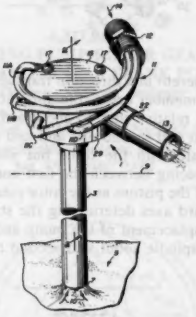
a. an undivided chamber having an approximately cylindrical wall, said chamber having a first cover means for sealably engaging one end of said undivided chamber and a second cover means for sealably engaging an opposite end of said undivided chamber; said undivided chamber being bounded by interior surfaces of said approximately cylindrical wall and said first and second cover means such that any two points anywhere on said approximately cylindrical wall can be connected by a straight line which does not intersect any part of said first cover means or said second cover means;

b. a suction inlet approximately centrally disposed in said second cover means;

c. first conducting means for conducting said first fluid and said solid particles directly into said undivided chamber through said suction inlet, there being no portion of said first cover means said second cover means or said first conducting means obstructing passage of any of said solid particles through said first conducting means into said undivided chamber;

d. a high pressure inlet in said approximately cylindrical wall;

e. second conducting means for tangentially injecting a second fluid through said high pressure inlet directly into



said undivided chamber to produce a vacuum producing vortex in said undivided chamber, said first fluid and said solid particles being forced into said vortex via said suction inlet in response to said vacuum to mix said first and second fluids and said solid particles together, said solid particles being centrifugally forced to circulate about the periphery of said vortex along the inner surface of said cylindrical wall; and

f. an outlet in said approximately cylindrical wall for exhausting a mixture of said first fluid, said second fluid, and said particles from said undivided chamber without buildup of any of said solid particles anywhere in said undivided chamber.

6. The aspirator of claim 5 further including a plurality of tangentially inclined high pressure inlets in said tapered, approximately cone-shaped portion of said housing for tangentially injecting said second fluid into said tapered, approximately cone-shaped portion of said vortex chamber to aid in gradually accelerating said particles.

4,227,864

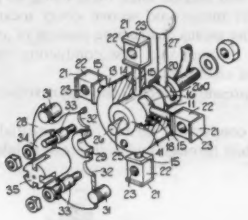
PUMP FOR LIQUIDS

Edward N. Gaffney, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Feb. 1, 1979, Ser. No. 8,532
Claims priority, application United Kingdom, Feb. 17, 1978, 6327/78
Int. Cl.[3] F04B 1/12, 27/08
U.S. Cl. 417—269 3 Claims

1. A pump, for liquids, comprising a rotor having therein a plurality of radially extending bores each slidably receiving a piston, the pistons being coupled at their outer ends to means constraining the pistons, when rotating with the rotor, to rotate about an axis spaced from but parallel to the axis of rotation of the rotor whereby the pistons reciprocate in their

respective bores so that the radially innermost ends of the pistons cooperating with liquid inlet and outlet means within the rotor effect a pumping action, the rotor being mounted on a hollow shaft for rotation relative thereto about a first axis, the outer surface of said shaft being formed with recesses which, with the rotor, define inlet and outlet chambers communicating with said bores of the rotor as the rotor rotates, a spindle is rotatable in said hollow shaft about a second axis parallel to but spaced from said first axis, and said means constraining said pistons includes a member engaged with each piston for move-



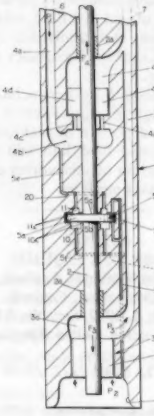
ment relative thereto in a direction transverse to the length of the piston, said member being rotatably mounted on said spindle for rotation relative thereto about a third axis parallel to and spaced from said second axis and said member being constrained to rotate with the rotor but about said third axis whereby the spacing between the first and third axes effects reciprocation of the pistons as the rotor rotates, said spacing of the first and third axes determining the stroke of the pistons and thus the displacement of the pump and being variable by rotation of the spindle about said second axis relative to said shaft.

4,227,865

CONSTANT FLUID FILM THICKNESS HYDROSTATIC THRUST BEARING

John W. Erickson, Huntington Beach, and John M. Kelleher, La Palma, both of Calif., assignors to Kobe, Inc., City of Commerce, Calif.

Filed Apr. 27, 1979, Ser. No. 33,773
Int. Cl.³ F04B *47/08, 47/14*
U.S. Cl. 417—365 **9 Claims**



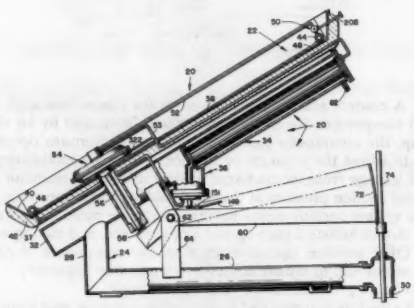
1. An apparatus for automatically and continuously balancing the thrust forces generated by a pump driven by a fluid motor, comprising: a hydrostatic thrust bearing disposed on a shaft connecting the fluid motor and the pump, said thrust bearing comprising: a circular flange secured to said shaft; a pair of annular chambers adjacent said flange; first conduit means connecting one annular chamber to the pressurized fluid output of said pump to oppose the thrust force of said pump; second conduit means connecting the other annular chamber to the pressurized fluid input to said fluid motor to oppose the thrust force of said fluid motor, the effective areas of said two annular chambers being respectively proportioned to the normal thrust forces respectively generated by said pump and motor, whereby the effective net force exerted by fluid pressures in said annular chamber on said circular flange continuously offsets any variation in thrust forces exerted on said shaft by said pump and said fluid motor.

4,227,866

SOLAR ENERGY DEVICE

Harvard P. Stubbs, Chihuahua, Mexico, assignor to Solar Pump Corporation, Las Vegas, Nev.

Filed Dec. 16, 1976, Ser. No. 751,105
Int. Cl.³ F04B *17/00;* **F03G** *7/02;* **F01K** *11/00*
U.S. Cl. 417—379 **7 Claims**

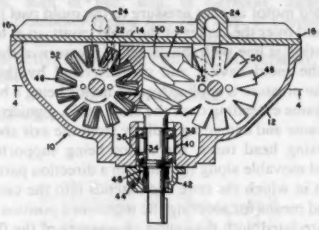


1. A solar energy powered pumping device, comprising:
a panel-type solar collector for receiving and concentrating heat from the sun's rays including an outer enclosure;
means providing an array of conduits adapted to carry a vaporizable working fluid within the enclosure of said collector and to absorb the collected heat, said conduits having a common inlet and a common outlet;
a vapor pressure actuated motor means located within the enclosure of said collector, said motor means having a reciprocating drive shaft extending from said collector and connected to a vertical reciprocation, sucker rod type well pump, and including a mechanical linkage means connecting the motor drive shaft to a reciprocating shaft of the well pump;
motor means having control means connected to said common outlet for receiving and exhausting vaporized fluid;
frame means supporting said collector;
condenser means supported by said frame means for receiving vapor exhausted from said motor means and condensing it to its liquid form for recycling to said collector;
working fluid pump means attached to said condenser means for supplying condensed fluid to said common inlet for said conduits in said collector; and
means for delivering water from the well pump through said condenser for condensing vaporized fluid therein, including hollow structural support members of said frame means, defining a conduit connected to the well pump and to the condenser, said condenser being inclined and including an outlet at its upper end for pumped water.

4,227,867
GLOBOID-WORM COMPRESSOR WITH SINGLE PIECE HOUSING

Cassius F. Whitehill, Hudson, Ohio; Robert D. Whitehill, Franklin, Pa., and Ghanshyam C. Patel, Solon, Ohio, assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,518
Int. Cl.³ F04C *18/20, 19/02*
U.S. Cl. 418—97 **4 Claims**

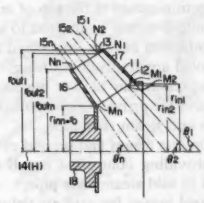


1. A gaseous medium compressor of the globoid-worm type having a cylindrical rotor formed with a plurality of threads in meshing relation with a pair of star pinions, said compressor having a single piece housing open at one end and having a large diameter bore for accommodation of the cylindrical rotor and a small diameter bore in axial alignment with the large diameter bore, said rotor having an integral shaft supported by a bearing means arranged in the small diameter bore and projecting from the housing, said star pinions being arranged on opposite sides of the cylindrical rotor and each having a shaft supported at only one end in a bore formed in the housing, said housing being arranged to completely enclose the cylindrical rotor and the star pinions, a cover means removably affixed to the housing at the open end for enclosure of the housing interior, a gaseous medium inlet formed in the housing in the region of the rotor shaft bearing means, said housing being formed with passageways for receipt of gaseous medium compressed by inter-action of the rotor and the star pinions, and gaseous medium outlets formed in the cover and connecting with said passageways.

4,227,868
SINGLE-CURVATURE FAN WHEEL OF DIAGONAL-FLOW FAN

Yoshiyasu Nishikawa, Ono; Chosei Harada, Akashi, and Masao Nakano, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Jan. 25, 1978, Ser. No. 872,459
Claims priority, application Japan, Jan. 28, 1977, 52/8947
Int. Cl.³ F04D *29/30*
U.S. Cl. 416—186 R **2 Claims**

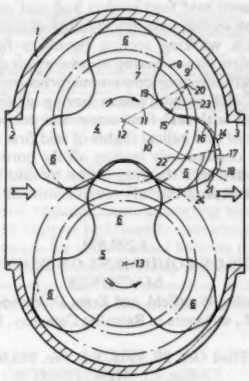


1. A fan wheel of a diagonal-flow fan for propelling a flow of a gas, said fan wheel comprising a rotational shaft, a frustoconical main plate coaxially fixed to the shaft, a frustoconical side plate spaced apart from the main plate and forming therebetween a diagonal flow path for the gas, and a plurality of fan blades each fixed at respective opposite side edges to the inner surfaces of the main and side plates and having an inner entrance part and an outer exit part, said entrance and exit parts extending transversely with respect to said diagonal flow path, said blades being secured between said frustoconical main and side plates, said frustoconical side plate being coaxially fixed with respect to the axis of rotation of the shaft, the cone angle of the main plate being greater than the cone angle of the side plate, each of said fan blades comprising a curved plate of a surface shape conforming to a portion of a cylindrical surface with a longitudinal axis, said portion being formed of elements constituted by mutual intersection lines between cylindrical surface and successive coaxial conical surfaces varying between said conical surfaces of said main and side plates corresponding to ideal stream surfaces, said coaxial conical surfaces progressively diminishing in cone angle from said main plate to said side plate and having a common axis coinciding with said axis of rotation of the shaft and lying in a plane which is in parallel spaced relationship to said longitudinal axis of the cylindrical surface, said common axis being inclined at an angle with respect to said longitudinal axis when viewed in a direction perpendicular to said plane.

4,227,869
INTERMESHING PUMP ROTOR GEARS WITH INVOLUTE AND LINEAR FLANK PORTIONS

Sven E. Eriksson, Örebro, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Oct. 17, 1977, Ser. No. 842,559
Claims priority, application Sweden, Oct. 19, 1976, 7611579
Int. Cl.³ F04C *2/18*
U.S. Cl. 418—206 **4 Claims**



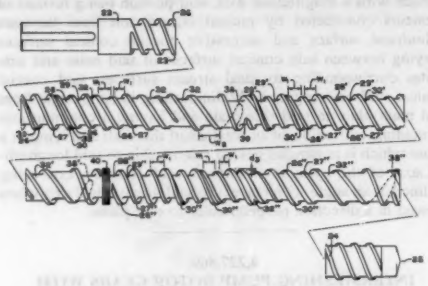
1. A pair of intermeshing rotor gears for a rotary piston pump comprising at least two lands, each defining a root and a crest and intervening grooves, which lands rotate within a pump housing about a pair of spaced parallel axes defining the pitch circles (8) of the gear rotors, each of said lands having symmetrically profiled leading and trailing flanks describing a root circle (7) and a crest circle (9), said profiles comprising: a circular arc portion (15), an involute portion (16) merging with said circular arc portion and a substantially linear portion (17) extending from said involute portion and merging in a terminal portion cooperating with the wall of the pump housing, said involute portion and said linear portion being calibrated to maintain sealing cooperation between the involute portion of the leading flank of one of said rotor gears and the involute portion of the trailing flank of the other one of said rotor gears substantially where said flanks intersect the root circle until sealing cooperation is established between the involute portion of the trailing flank of said one gear rotor and the involute portion of the leading flank of said other rotor to thereby prevent leakage of working medium and overcompression thereof between rotor lands during rotation thereof.

4,227,870

APPARATUS FOR WORKING RUBBER COMPOUNDS

Heung T. Kim, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 14, 1979, Ser. No. 20,289
Int. Cl.[3] B29F 3/02
U.S. Cl. 425—208 6 Claims



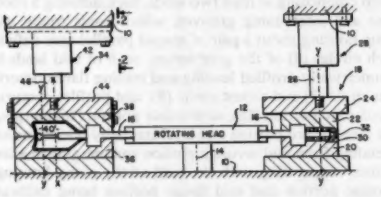
5. In an extruder for processing rubber compounds comprising a cylinder; said cylinder having a die means at one end thereof; a feed screw rotatably mounted in said cylinder for moving rubber compounds therethrough to progressively masticate and shear said compounds for extrusion therefrom; said feed screw having a feed section at one end and a metering section at the other end; said feed screw having a transition section between said feed section and said metering section; said transition section having a plurality of successive working sections; each working section having a first and second means; said first means having at least a pair of helical flights for operatively exerting continuous pressure on said rubber compounds; said second means having at least one helical flight integral with said feed screw and cooperative with an adjacent one of said helical flights of said first means to define a groove for continuously leading off the portion of said compound subjected to a shearing action by said helical flight of said first means progressively receive worked compounds.

4,227,871

LOCATION OF EQUIPMENT ON BLOW MOLDING MACHINES

Dewey Rainville, Westfield, and Ernst D. Wunderlich, Teaneck, both of N.J., assignors to Rainville Company, Inc., Middlesex, N.J.

Filed Oct. 20, 1978, Ser. No. 953,073
Int. Cl.[3] B29C 17/07
U.S. Cl. 425—533 7 Claims



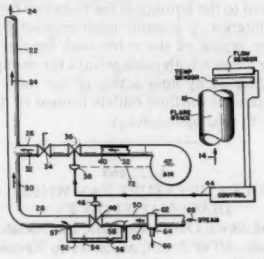
1. In an injection blow molding apparatus including an indexing head from which core rods extend into molds at angularly related stations around an axis about which the indexing head turns to move the core rods successively from one operational station to another, characterized by one of the stations including a mold support, a mold in said support with upper and lower parts that have relative movement toward and from one another in a direction parallel to said axis to open and close a cavity within the mold, the mold being replaceable with another similar mold that encloses a cavity of a different size from that of the first mold, means for supporting the molds with the center of said similar mold cavity at a different distance from said axis of the indexing head, a motor supported in position for applying pressure to either of the mold parts to hold one mold part closed against the other mold part, an upper frame above the mold parts and by which the motor is supported and with respect to which the motor is moveable in directions for changing the position of the motor toward and from the axis of rotation of the indexing head to a location at which said motor applies pressure to the mold part that is held closed, and over the center of the mold cavity so as to maintain said location in line with the center of pressure of fluid applied within the mold cavity, and characterized by the mold to which the pressure is applied by said motor being a blow mold, a fixed frame extending over the blow mold, a guide supported by the frame and extending radially from the axis about which the indexing head turns, the motor being supported by the guide and movable along the guide in a direction parallel to the direction in which the core rod extends into the cavity of the mold, and means for securing the motor in a position along the guide correlated with the center of pressure of the fluid in the cavity of the blow mold.

4,227,872

APPARATUS FOR SUPPLYING ALTERNATE GASES TO STEAM INJECTION MEANS ON A FLARE STACK

John S. Zink, and Robert D. Reed, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 739,606, Nov. 8, 1976, abandoned. This application May 30, 1978, Ser. No. 910,446
Int. Cl.[3] F23H 5/24
U.S. Cl. 431—90 11 Claims



1. In a flare stack system in which waste gas is flared on demand, and in which the flow rate of waste gases may vary from low flow rates to high flow rates of up to 100% of the design value of gas flow rate; and including

steam injection means at the top of said flare stack comprising manifold means connected to a steam riser pipe, and plural injection nozzles connected to said manifold;

the improved apparatus comprising;

(a) low pressure air blower means, and first controllable air valve for providing controlled on-off flow of blower air to said steam riser pipe;

(b) steam line means and second controllable steam valve for providing controlled on-off flow of steam on demand to said steam riser pipe;

(c) control means for said air valve and steam valve for alternate flow of air or steam to said steam riser pipe, such that under freezing atmospheric temperature conditions, low pressure air is flowed through said steam riser pipe to said steam injection means when said gas flow rate is low; and steam under substantial pressure is flowed through said steam riser pipe to said steam injection means, when said gas flow rate is high, and

whereby when said steam valve is open said air valve is closed, and vice versa; and

(d) said control means responsive to said flow rate of waste gas, to open said steam valve whenever waste gases are being flared at said high flow rate.

4,227,873

KILN WITH OVERLYING BEDS

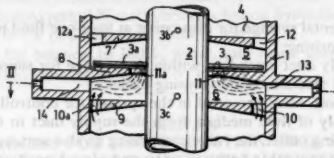
Theodor Manshausen, Cologne, and Walter Fritsch, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,665

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754844

Int. Cl.³ F27B 9/02

U.S. Cl. 432—131 **4 Claims**



3. A kiln for processing material with treatment gases and hot gases comprising a generally vertically mounted hollow cylindrical kiln structure having a wall, a center hollow shaft extending upwardly centrally of said hollow cylindrical kiln, a plurality of rabble arms mounted on said center hollow shaft, a plurality of horizontal floors mounted parallel to and above each other in said kiln, alternate ones of said plurality of floors formed with pluralities of openings about their peripheries, the other one of said plurality of floors formed with pluralities of openings about said hollow cylindrical shaft, a first means mounted in the wall of said kiln for directing hot gas into said kiln over one of said openings in the periphery of one of said alternate floors and in a direction generally tangentially to the wall of said kiln.

4,227,874

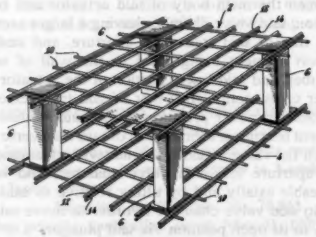
TEMPERATURE RESISTANT, STRUCTURALLY STABLE MEMBER

John J. Nugent, Huntington, Conn., assignor to Rolock, Inc., Fairfield, Conn.

Filed May 24, 1978, Ser. No. 909,097

Int. Cl.³ C21D 9/00

U.S. Cl. 432—261 **13 Claims**



1. A heat resistant, structurally stable rod for racks or baskets used in high-temperature heat treatment processes, said rod including

a strengthening core having a melting point higher than temperatures used in said heat treatment processes and capable of maintaining rigidity and not softening at said process temperatures, said core crystallizing at temperatures less than said process temperatures, and

a protective covering of weldable material encasing said strengthening core, said material having a crystallization temperature higher than said process temperature and being of sufficient thickness to be welded and to maintain said core agaist frangibility at temperatures up to said process temperature,

said protective covering being tightly secured around the outer surface of said strengthening core for constraining said strengthening core to provide that said strengthening core will be held together substantially in its initial position relative to said protective covering in the event that said strengthening core crystallizes so that the structural supporting strength of said strengthening core will be utilized even if said strengthening core crystallizes,

said strengthening core having a diameter between about 0.1875" and about 0.500".

4,227,875

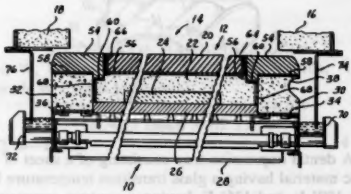
ROTARY HEARTH FOR CALCINING KILN

Hubert L. Hall, deceased, late of Nassau, The Bahamas (by Noel S. Roberts, executor), assignor to Calcimatic International Limited, Grand Cayman, Cayman Islands

Filed Sep. 12, 1978, Ser. No. 941,745

Int. Cl.³ F27D 3/00

U.S. Cl. 432—239 **10 Claims**



1. A rotary hearth for a kiln assembly including in combination a circular refractory layer adapted to support material to be heated, a metal undercarriage supporting said refractory layer, a refractory buttress peripherally containing said refractory layer, and means for securing said buttress to said undercarriage, said refractory buttress being unconfined peripherally to permit free expansion and contraction without contact between the peripheral surface thereof and said undercarriage.

4,227,876

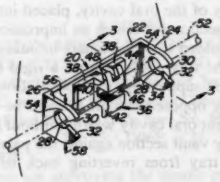
ORTHODONTIC BRACKET

Maxwell S. Fogel, Apt. 1801, 9100 Atlantic Ave., Island House, and Jack M. Magill, Apt. 1010, 9600 Condominium, 9600 Atlantic Ave., both of Margate, N.J. 08402

Filed Feb. 16, 1979, Ser. No. 12,622

Int. Cl.³ A61C 3/00

U.S. Cl. 433—11 **7 Claims**



1. In combination an orthodontic bracket for securement to the anterior surface of teeth and an arch wire, said bracket including a pair of planar C-shaped spaced securement members, each of said members including a portion of reduced

thickness each of said members including an opening with a flared mouth to facilitate insertion of said arch wire, said mouth being narrowest at the junction of said mouth and said opening, the diameter of said arch wire being slightly larger than the width of the smallest opening of said mouth so that said arch wires are snapped into said opening when said arch wire is urged therein, said members each being deformed in the plane of said member with said mouth closed by squeezing said members about said opening with a plier type tool so that said bracket securely holds said arch wire at two spaced apart points.

4,227,877

ANATOMICAL INTRA-ORALLY MOLDABLE DENTAL IMPRESSION TRAY AND METHOD

Kenneth E. Tureaud; Stephen Ginsburg, both of Ann Arbor, and Frederick Draheim, Orchard Lake, all of Mich., assignors to Black Knight Investments, Limited, Grand Cayman, Cayman Islands

Continuation-in-part of Ser. No. 754,107, Dec. 27, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,443

Int. Cl.[2] A61C 9/00

U.S. Cl. 433—37 **23 Claims**

1. A dental impression tray consisting of a sheet of thermoplastic material having a glass transition temperature between about 100° F. and 135° F. having a contour approximating a section of a patient's oral cavity of which an impression is to be made and peripheral borders shaped to cover the adjacent tissue areas with relief for the functioning musculature and related attachments, whereby the tray may be heated above its glass transition temperature exteriorly of the oral cavity and placed into the patient's mouth at a temperature low enough to not cause discomfort where it can be manually molded to approximate intimacy with that oral section before the tray cools below its glass transition temperature in the mouth of the patient to form a rigid final impression tray which is self-supporting and accurately maintains the molded structure.

16. A dental impression tray comprising: a sheet of thermoplastic material which can be molded when heated to a temperature above the temperature encountered in the oral cavity of which an impression is to be made, said sheet having a U-shaped trough adapted to engage an alveolar ridge and a palatal vault engaging section extending from and supported within the trough, said vault section having a pleat extending away from the vault engaging side, whereby the tray may be heated exteriorly of the oral cavity, placed into position relative to the oral section for which an impression is to be made and manually molded to approximate intimacy with that oral section before the tray cools to form a rigid final impression tray which is self-supporting, said pleat allowing the lateral separation of the opposed trough sides to be adjusted to accomodate different oral cavity widths without interfering with the fit of the tray vault section against the palate and aiding in preventing the tray from reverting back to its premolded shape.

4,227,878

DENTAL HANDPIECE

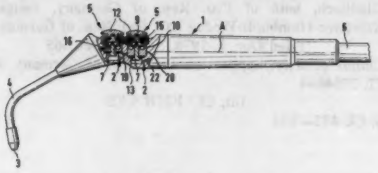
Gerd Löhn, Biberach, Fed. Rep. of Germany, assignor to Kaltenbach & Voigt GmbH, Biberach, Fed. Rep. of Germany

Filed Feb. 27, 1978, Ser. No. 881,565

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 7707816[U]

Int. Cl.[3] A61G 17/02

U.S. Cl. 433—80 **15 Claims**



1. A dental syringe for dispensing at least one fluid medium and comprising:

a supply duct extending within the syringe for supplying a fluid medium to a dispensing outlet;

a shut-off valve provided in the syringe for controlling the supply of fluid medium from the supply duct to the dispensing outlet, the valve comprising a valve seat, a closure body moveable between open and closed positions relative to said valve seat and arranged to be biased to its closed position by the action of the closure body of fluid medium when the latter is supplied by said duct to said valve, and a plunger operable from externally of the syringe to move the closure body from the closed position to the open position;

a valve actuator accessible from externally of the syringe and coupled with said plunger, said valve actuator being coupled with said valve in such a way as to avoid unintentional removal of the valve actuator from the syringe;

said actuator being supported by a resilient support element arranged resiliently to resist movement in a direction transverse to the axis of said plunger;

a transverse aperture provided in said syringe, said valve actuator extending through said aperture;

and a valve chamber communicating with said dispensing outlet and being communicable with said supply duct via said valve seat when said closure body is in its open position, the said valve chamber receiving said plunger and being sealed against loss of fluid medium to the exterior of the handpiece via said transverse aperture, and the whole of said valve chamber having a cross-section which is at least as large as that of said transverse aperture;

said actuator having a lower portion extending from the main body of the actuator into said valve chamber, and said resilient support element being inserted under stress between the main body of said actuator and said lower portion, said valve chamber having a larger cross-section than that of said transverse aperture, and said resilient support element being fixed to the wall of said valve chamber, and said lower portion of the actuator having a larger cross-section than that of said transverse aperture and bearing under pressure against said resilient support element bearing at an inner rim of said transverse aperture;

in which the valve actuator extends with clearance through said aperture into said valve chamber, and is thereby moveable axially and by tilting relative to said aperture and to said valve chamber in order to move said closure body to its open position via said plunger;

and in which the cross-section of at least that part of said valve chamber in which the valve actuator is moveable is at least as large as the cross-section of said aperture.

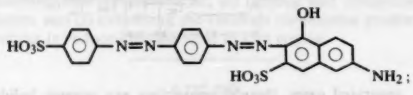
4,227,879

CONCENTRATED DIRECT DYE SOLUTION

Allan M. Huffman, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed Apr. 17, 1978, Ser. No. 897,130
Int. Cl.[2] C09B 27/00; D06P 1/02
U.S. Cl. 8—602 5 Claims

1. A concentrated liquid dye solution comprising, by weight:
(a) from 10 up to 30% of a dye, which in its free acid form has the formula:



(b) 5–20% of at least one base selected from the group consisting of 2,2′-iminodiethanol, choline, monoethanolamine, dimethylethanolamine, diisopropanolamine and N-hydroxyethyl-N-methylmorpholinium hydroxide;
(c) 0–5% of alkali metal cations; and
(d) the balance, to 100%, water, said liquid dye having an a_{max} value of at least 17.4 cm^2/mg.

4,227,880

PROCESS FOR THE PRODUCTION OF DUSTFREE GRANULES OF DYES AND OPTICAL BRIGHTENERS

Helmut Hohenegger, Riehen; Hanspeter Baumann, Lausen, and Urs Büchel, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 14, 1978, Ser. No. 896,417
Claims priority, application Switzerland, Apr. 18, 1977, 4758/77; Mar. 17, 1978, 2936/78
Int. Cl.[2] D06P 1/64; C09B 67/00; C09K 11/02
U.S. Cl. 8—524 10 Claims

1. Process for the production of solid dustfree preparations of water-soluble dyes and optical brighteners, which comprises subjecting the pulverulent dyes or optical brighteners, together with a melt or a solution of ethylene carbonate or propylene carbonate, to a dynamic treatment.

4,227,881

NEW PROCESS OF COLOR STRIPPING DYED TEXTILE FABRIC

Andrew Fono, Montclair, N.J., assignor to Royce Chemical Company, East Rutherford, N.J.

Filed Nov. 17, 1978, Ser. No. 961,728
Int. Cl.[2] D06L 3/00
U.S. Cl. 8—102 15 Claims

1. A composition for stripping dye from textile fabric which comprises an aqueous solution of about 0.5% to 3.5% sodium hydroxymethane sulfinate, about 1% to 3.5% of a ammonium salt and about 1% to 3.5% of a sulfite salt maintained at a temperature of at least about 140° F. and having a pH of from about 5 to 9.

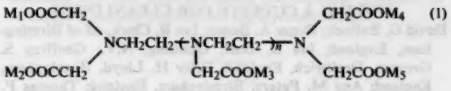
4,227,882

METHOD OF TREATING FIBER OR FIBROUS MATERIAL

Toshio Saito, Nagahama; Masao Oguchi, Suita, and Akio Kisaichi, Nagahama, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Sep. 6, 1979, Ser. No. 72,861
Claims priority, application Japan, May 31, 1979, 54-69223
Int. Cl.[3] D06M 9/00
U.S. Cl. 8—115.5 14 Claims

1. A method of treating fiber or fibrous material, comprising treating fiber or fibrous material having active hydrogen and graft-polymerized with a water-soluble vinyl monomer, with a processing agnt consisting mainly of a compound having the following general formula



(1)

wherein M_1—M_3 represent a hydrogen atom or alkali metal, and n represents 0 or 1.

4,227,883

PROCESS AND COMPOSITION FOR CLEANING OR DE-OILING TEXTILE MATERIALS

Michel Peignier, Versailles, and Claude Renault, Saint-Remy-Les Chevreuse, both of France, assignors to Rhone Poulenc Industries, Paris, France

Filed Nov. 1, 1978, Ser. No. 956,627
Claims priority, application France, Jun. 30, 1978, 78 19589
Int. Cl.[2] D06L 1/00
U.S. Cl. 8—142 12 Claims

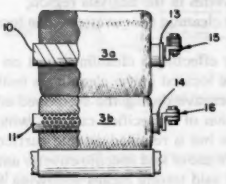
1. A process for anti-redeposition, which has the effect of reducing greying by redeposition of staining substances on textiles of natural, synthetic or artificial fibers or mixtures thereof, in the course of operation of dry cleaning, or de-oiling by means of perchloroethylene, comprising incorporating in the perchloroethylene a sufficient anti-greying amount of at least one monoketone anti-redeposition additive having a boiling point which does not exceed 160° C. to observe the desired anti-redeposition effect.

4,227,884

METHOD OF HANDLING YARN

Richard W. Primm, deceased, late of Thomasville, N.C. (by Gertrude B. Primm, executrix)

Filed Apr. 27, 1979, Ser. No. 34,201
Int. Cl.[3] D06B 5/18, 23/00
U.S. Cl. 8—155.1 4 Claims



1. A method for processing texturized yarn comprising: unwinding highly tensioned texturized yarn from a spool, winding the unwound yarn onto a perforated core under a lesser tension by frictionally engaging said perforated core with a roller means, contacting said yarn on said spool with said perforated core, and rotating said roller means to transfer yarn to said perforated core, and treating the yarn wound on said perforated core.

4,227,885

SOLUTION ANNEALING OF ARAMID AND STRUCTURALLY RELATED FIBERS

William L. Hofferbert, Jr., Durham, and Jack Preston, Raleigh, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

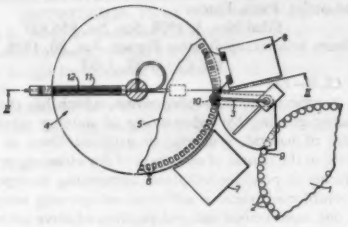
Filed Nov. 3, 1978, Ser. No. 957,625
Int. Cl.[2] D06P 3/24
U.S. Cl. 8—925 9 Claims

1. A process for improving the tensile properties of aramid fibers which comprises treating said fiber with a liquid tertiary amine for at least 10 seconds, wherein said amine is maintained at a temperature of at least 80° C., but less than that temperature at which deterioration of said fiber occurs.

4,227,886
TESTING A CUVETTE FOR CLEANLINESS

David G. Bullock; Roger A. Bunce; Ian R. Clark, all of Birmingham, England; Ian D. Duff, Ossining, N.Y.; Geoffrey S. Greaves, Droitwich, England; Peter H. Lloyd, Birmingham, England; Ann M. Peters, Birmingham, England; Thomas P. Whitehead, Leamington Spa, England, and Peter Wilding, Birmingham, England, assignors to National Research Development Corporation, London, England

Filed May 13, 1977, Ser. No. 796,612
Claims priority, application United Kingdom, May 13, 1976, 19850/76; May 3, 1977, 19850/77
Int. Cl.[2] B08B *7/00, 5/04;* G01N *29/02*
U.S. Cl. 23—230 R 16 Claims



1. Apparatus for use in analyzing specimens, said apparatus comprising:

a carrier having mounted thereon a plurality of cuvettes for containing specimens to be analyzed;

means for advancing the carrier to cause each cuvette to pass repeatedly through, in succession, a specimen loading region, an analysis region, a cleaning region, and a cleanliness testing region;

means for introducing specimens into said cuvettes while they are located in the specimen loading region;

means for performing an analytical test on the specimens in the cuvettes in the analysis region;

means for cleaning the cuvettes when located in the cleaning region;

means for effecting a cleanliness test on the cuvettes when they are located in the cleanliness testing region; and

means operative during the continued advancement in said succession of a specified cuvette, which fails the cleanliness test but is retained on said carrier, for inhibiting the effective use of said specific cuvette until it is tested favorably by said testing means following at least one further cleaning of that specific cuvette by said cleaning means.

4,227,887
DETERMINATION OF TOTAL ORGANIC HALIDES IN WATER

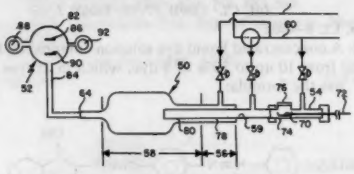
Yoshihiro Takahashi, San Francisco; Robert T. Moore, Palo Alto, and Robert J. Joyce, Cupertino, all of Calif., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 28, 1978, Ser. No. 937,652
Int. Cl.[3] G01N *31/12, 31/16, 33/18*
U.S. Cl. 23—230 PC 23 Claims

23. A process for converting organic halides in a water-containing sample to measurable halides, said process comprising the steps of:

(a) in a first heating zone, heating said sample in the presence of a mild oxidant but in the absence of oxygen, said heating in said first heating zone causing water to vaporize from said sample but not causing water to sputter; and thereafter

(b) in a second heating zone, heating the remaining sample and any gases generated in the first heating zone in the presence of an oxidant, said heating in said second heating zone causing complete combustion of the sample and



generated gases, thereby converting any organic halides present to measurable halides.

4,227,888
METHOD FOR THE QUANTITATIVE DETERMINATION OF CYANIDE

Melvin L. Rueppel, Kirkwood, and Chihyuan C. Ting, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 18, 1978, Ser. No. 970,689
Int. Cl.[2] G01N *31/22, 33/18*
U.S. Cl. 23—230 R 9 Claims

1. A method for quantitatively determining the cyanide content of a solution containing interfering aldehydes and/or ketones which comprises sequentially the steps of

(a) treating the solution with an amount of a compound of the formula

$$R - NH_2$$

wherein R is selected from the group consisting of hydroxyl, lower alkoxy and

wherein R_1 and R_2 are independently hydrogen or any radical which does not contain groups capable of being hydrolyzed to hydrogen cyanide; sufficient to react with the total aldehyde and ketone content;

(b) maintaining the pH of the solution at a level sufficient to convert any cyanohydrin to free cyanide,

(c) means for quantitatively determining the level of free cyanide as a measure of the cyanide content of the solution.

4,227,889
COMPRESSION IGNITION FUELS FOR USE IN DIESEL ENGINE HAVING ANTI-WEAR PROPERTIES

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1978, Ser. No. 973,003
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—56 27 Claims

1. As a new composition of matter, an anti-wear compression ignition fuel composition for use in diesel engines comprising (1) from about 70 percent by weight to about 98.45 percent by weight of a monohydroxy alkanol having from 1 to 5 carbon atoms, (2) from about 1 percent by weight to about 25 percent by weight of a fuel oil boiling above the gasoline boiling range, and (3) a wear inhibiting amount of a dimerized unsaturated fatty acid.

10. A method for inhibiting engine wear in an internal combustion reciprocating diesel engine operating on a compression

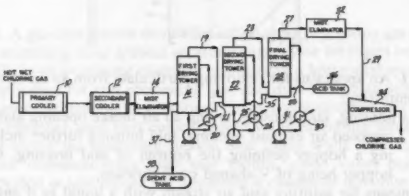
ignition fuel comprising (1) from about 70 percent by weight to about 98.45 percent by weight of a monohydroxy alkanol having from 1 to 5 carbon atoms (2) from about 1 percent by weight to about 25 percent by weight of a fuel oil boiling above the gasoline boiling range, and (3) a wear inhibiting amount of a dimerized unsaturated fatty acid, said method comprising (a) supplying to the fuel induction system of said engine said compression ignition fuel, (b) inducting air into the combustion chambers of said engine (c) compressing said air, (d) injecting said compression ignition fuel into said combustion chambers containing said compressed air, (e) igniting said compressed mixture, and (f) exhausting the resultant combustion products resulting in reduced engine wear in said engine.

4,227,890

PROCESS FOR COOLING AND DRYING CHLORINE GAS

Joseph L. Wood, Westminster, Md., and Matthew F. Lipworth, Chattanooga, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed May 11, 1978, Ser. No. 904,821
Int. Cl.[2] B01D *53/02, 53/14*
U.S. Cl. 55—30 **5 Claims**



1. A process for cooling and drying wet chlorine gas by contacting said wet gas with sulfuric acid in at least two drying towers in series which comprises the steps of:

(a) feeding wet chlorine gas to a first drying tower,

(b) contacting in said first drying tower said wet chlorine gas with sulfuric acid to remove water and produce a partially dry chlorine gas,

(c) feeding said partially dry chlorine gas to the final drying tower,

(d) contacting in said final drying tower said partially dry chlorine gas with concentrated sulfuric acid to produce a dry chlorine gas containing less than about 10 parts per million by weight of water, having a temperature of from about 12° to about 16° C., and

(e) feeding said cool, dry chlorine gas to a compressor without intermediate cooling between steps (d) and (e).

4,227,891

RECOVERY OF HYDROCARBON VAPORS FROM AIR

Keith D. Maguire, and Royce A. Currieo, both of Sand Springs, Okla., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio

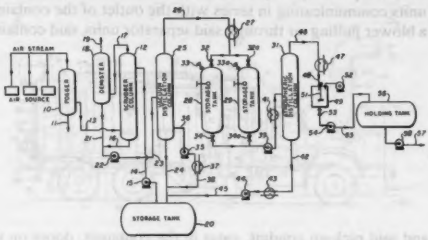
Filed Jan. 29, 1979, Ser. No. 7,351
Int. Cl.[3] B01D *47/00;* **C07C** *7/05;* **B01D** *3/10*
U.S. Cl. 55—85 **6 Claims**

1. The process of recovering aliphatic or aromatic hydrocarbon vapors capable of auto-polymerization from air comprising,

scrubbing an air stream containing said hydrocarbon vapors with a liquid plasticizer absorbent having substantially zero vapor pressure during the scrubbing step and which will not contaminate the hydrocarbon to absorb the hydrocarbon in the plasticizer,

distilling the plasticizer and absorbed hydrocarbon under partial vacuum conditions to obtain a first distillate of plasticizer and the hydrocarbon,

distilling the first distillate under atmospheric pressure to obtain a second distillate of the hydrocarbon,



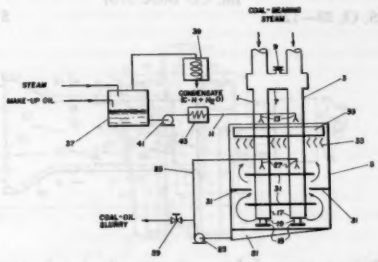
and separately recovering the hydrocarbon and the plasticizer.

4,227,892

METHOD AND APPARATUS FOR REMOVING MICRONIZED COAL FROM STEAM

Joseph Vlnaty, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Dec. 4, 1978, Ser. No. 966,204
Int. Cl.[3] B01D *47/06*
U.S. Cl. 55—89 **21 Claims**



1. Apparatus for removing micronized coal from steam in a coal pulverizer comprising:

a housing;

a conduit extending downward into and terminating in the lower portion of said housing;

means in said conduit for spraying petroleum oil into the flow of coal-bearing steam in the conduit;

means defining an impact surface disposed in spaced relation to the lower end of said conduit against which said flow impacts at a substantial angle to the surface thereof such that a coal-oil slurry is deposited thereon;

means for collecting the coal-oil slurry deposited on said surface;

a discharge opening near the top of said housing for said steam; and

baffles in said housing for reducing the velocity of said steam, as it rises to the discharge opening, below the settling velocity of the oil droplets, whereby additional coal-oil slurry will separate from the steam.

4,227,893

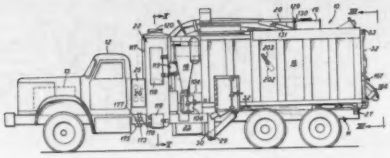
MOBILE VACUUM LOADER

Roland E. Shaddock, Streator, Ill., assignor to Peabody-Myers Corporation, Streator, Ill.

Filed Sep. 1, 1978, Ser. No. 939,054
Int. Cl.[3] B01D *35/12, 37/00, 50/00*
U.S. Cl. 55—97 **37 Claims**

12. An industrial vacuum cleaner having a materials collec-

tion container with a front end and a top and having an outlet adjacent the top, a pick-up conduit discharging into the container, a plurality of particulate material removing separator units communicating in series with the outlet of the container, a blower pulling air through said separator units, said container



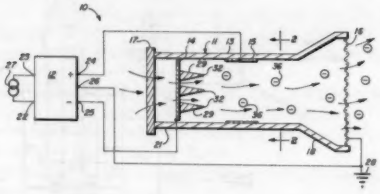
and said pick-up conduit, gates in the container, doors on the container adjacent said gates providing access to said gates from the outside of said container, and said gates selectively controlling air flow through all of said separator units or to by-pass a unit.

4,227,894

ION GENERATOR OR ELECTROSTATIC ENVIRONMENTAL CONDITIONER

John D. Proynoff, 3315 N. 25th Pl., Phoenix, Ariz. 85016

Filed Oct. 10, 1978, Ser. No. 949,411
Int. Cl.[2] B03C *3/01*
U.S. Cl. 55—126 **5 Claims**



1. An apparatus for generating negative ions for propulsion into the atmosphere of a controlled environment comprising:

an ion gun,

said gun comprising an open ended hollow elongated tubular shell flared outwardly at its exhaust end,

a negative electrode positioned to extend across at least a part of said shell at a given distance from the opposite end of said shell,

said negative electrode comprising a plurality of spaced protrusion extending from a plate mounted transversely of the hollow interior of said shell longitudinally of and toward said flared end of said shell,

said protrusions comprising conically shaped configurations having rounded apexes to reduce ozone generation mounted with their bases on said plate and their apex ends extending toward the flared end of said shell,

a positive ring shaped anode arranged around at least a part of the periphery of said shell at a second greater distance from said opposite end of said shell,

a metallic screen mounted across said flared end of said shell,

a d-c source of electrical potential connected to said shell for charging said negative electrode and said positive anode sufficiently to generate negative ions at said negative electrode and to produce sufficient kinetic energy to expell the negative ions past said positive anode and out of said flared end of said shell, and

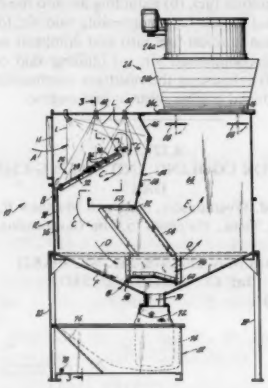
an air filter mounted transversely of the hollow interior of said shell between said opposite end of said shell and said negative electrode.

4,227,895

AIR SCRUBBER APPARATUS

Bruce T. E. Boon, Wayne, N.J., assignor to Eastern Cyclone Industries, Inc., Fairfield, N.J.

Filed May 21, 1979, Ser. No. 40,752
Int. Cl.[3] B01D *45/10*
U.S. Cl. 55—226 **12 Claims**



1. An apparatus for removing particulate from an air stream comprising:

a housing, said housing having an air intake opening and an opposed air exhaust opening, said housing further including a hopper defining the bottom of said housing, said hopper being of V-shaped configuration;

means for saturing said air stream with a liquid as it enters said housing for agglomerating said airborne particles with said liquid;

a first baffle disposed adjacent said air intake opening, and an inner wall member connected to the bottom edge of said first baffle and disposed parallel to and cooperating with a wall of said housing thereby forming a passageway, wherein the saturated air stream impinges on said first baffle and a portion of said liquid-particulate agglomeration is trapped by said first baffle and is channeled directly into said hopper through said passageway;

a second baffle including a partition section and a trough section, said partition section disposed intermediate and extending generally vertically downwardly from the top of said housing to a point intermediate the height of said housing, said trough section being connected to the bottom end of said partition section and including a pair of conduits in communication with said hopper and disposed along opposed end walls of said housing, with said first baffle being spaced from and overhanging said trough section of said second baffle to create a tortuous S-shaped path for said air stream with said partition section functioning to define a rear open area of relatively large volume adjacent said air exhaust opening;

a third baffle disposed directly above the apex of said V-shaped hopper acting as a divider to inhibit the air stream from reabsorbing said liquid-particulate agglomeration collected in said hopper; and

means for drawing said air stream into said housing, through said tortuous S-shaped path, said rear open area and out said exhaust opening, whereby the saturated air stream passing said first baffle impinges on said partition section of the second baffle such that another portion of said liquid-particulate agglomeration is trapped by said second baffle and channeled directly to said hopper by said conduits, and whereby after said saturated air stream passes said partition section of said second baffle, the path of said air stream is twisted such that it passes underneath said trough section and above said third baffle and thereafter is

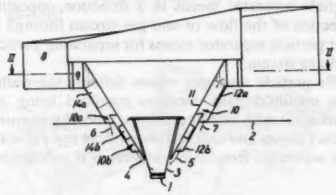
further twisted and drawn into said rear open area where said air stream expands such that particulates are removed by gravity from said air stream.

4,227,896

GAS DISTRIBUTION DEVICE FOR THE SUPPLY OF A PROCESSING GAS TO AN ATOMIZING CHAMBER

Finn H. Larsson, Tastrup, and Christian Schwartzbach, Malov, both of Denmark, assignors to A/S Niro Atomizer, Soborg, Denmark

Filed Aug. 3, 1979, Ser. No. 63,884
Claims priority, application Denmark, Aug. 17, 1978, 3640/78
Int. Cl.[2] B01D *47/16*
U.S. Cl. 55—260 **2 Claims**



1. A gas distribution device for supplying a processing gas to an atomizing zone around an atomizing device arranged centrally in an atomizing chamber, comprising a horizontal spiral supply duct for said processing gas, said duct having an annular mouth extending in rotational symmetry around the axis of the chamber, and two conical guide walls extending around and above the atomizing device, said guide walls limiting a space communicating with said mouth, guide vanes being provided in said mouth for imparting a change of direction to the gas stream from a mainly purely tangential flow in the spiral duct into a rotating flow with a smaller tangential velocity component in the space between the conical guide walls, wherein the improvement comprises that the guide vanes are arranged in the mouth with a small angular spacing and comprise two succeeding sets of stationary guide vanes, the guide vanes of one set being positioned at the external opening of the mouth towards the spiral duct and being shaped to deflect the gas stream to a flow direction, for which the radial velocity component considerably exceeds the tangential velocity component, the other vane set being positioned at the internal opening of the mouth towards the space between the conical guide walls, and each vane of said other vane set projecting into the space between the internal portions of neighbouring vanes of the first vane set and extending substantially parallel to tangential planes to these vanes at the internal edges thereof.

4,227,897

APPARATUS FOR RECOVERY OF FLARED CONDENSIBLE VAPORS

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company

Filed Mar. 5, 1979, Ser. No. 17,378
Int. Cl.[2] B01D *53/26*
U.S. Cl. 55—269 **6 Claims**

1. Apparatus for recovery of condensible vapors in waste gases which are to be flared, comprising;

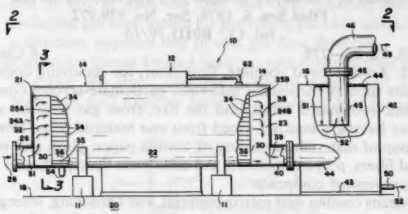
(a) a flare system including a flare gas line leading to a flare stack;

(b) a horizontal gas-to-cooling liquid heat exchanger inserted into such flare gas line to cool said flare gases prior to passage to the stack for burning, to a selected temperature, the exchanger having a gas inlet plenum at one end and an outlet plenum at the other end;

(c) means to cool and circulate the cooling liquid through said heat exchanger;

whereby flare vapors, the dew points of which are above said selected temperature, will condense; and

(d) means at the outlet end to separate the condensed vapors from the remaining flare gases; the improvement characterized by at least one tube positioned along the bottom of



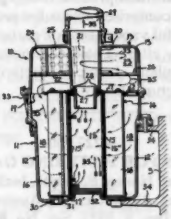
the heat exchanger to carry precondensed vapors in the waste gas directly from the inlet to the outlet plenum.

4,227,898

AIR CLEANER

Kunio Kamekawa, Hamamatsu, and Sumio Yagi, Iwata, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jan. 19, 1979, Ser. No. 4,930
Claims priority, application Japan, Jan. 31, 1978, 53/9991
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—276 **4 Claims**



1. An air cleaner comprising:

a hollow cylindrical casing body having an axis and an air inlet through its wall;

a lateral partition dividing the interior of the casing body into a passage chamber and a filter unit chamber, said lateral partition having an air intake opening passage therethrough and forming a limited intercommunication between said two chambers, and said air inlet opening into said passage chamber;

a cylindrical air filter element positioned in said filter unit chamber so as to provide an annular peripheral passage between it and the casing which is in communication with said air intake opening, said air filter element having a central cleaned air outlet, said chamber being axially aligned; and

a passage cylinder extending from outside the casing body and connected to the cleaned air outlet of the filter element;

a second lateral partition dividing said passage chamber into an upper and a lower passage, said air inlet entering said upper passage;

an axial partition adjacent to one side of said air inlet and dividing said upper passage, said second lateral partition having a throughhole between said upper and lower passage and positioned adjacent to the axial partition on the other side thereof from the air inlet, and said air intake opening in the first partition lying substantially axially aligned with said air inlet, entering said upper passage.

4,227,899
ABSOLUTE FLUID FILTER

Allan H. Meny, 1 Hoover St., North Arlington, N.J. 07032, and Dennis L. Palmer, 61 Douglas Dr., Towaco, N.J. 07082

Filed Sep. 6, 1978, Ser. No. 939,972
Int. Cl.[3] B01D *39/16*
U.S. Cl. 55—279 8 Claims

1. An improved absolute, fluid filter, for removing components such as particulate materials, particulate-aerosol combinants, sublimated solids, and the like, from gas streams, said filter having a matrix formed from one material taken from a group of materials consisting of treated paper, glass, and mineral fibers, polymeric fibers, and cellulostic fibers, wherein the improvement comprises:

means coating said matrix material, and hardening, strengthening, and toughening said matrix material, for enhancing components-release from said filter, whereby said filter is rendered cleanable and resuable; and said matrix material comprises a filter medium formed of fibers which latter fibers are formed of a compound of a polymer and a filler agent.

8. An improved absolute, fluid filter, for removing components such as particulate materials, particulate-aerosol combinants, sublimated solids, and the like, from gas streams, said filter having a matrix formed from a material taken from a group of materials consisting of treated paper, glass, and mineral fibers, ceramic fibers, polymeric fibers, and cellulostic fibers, wherein the improvement comprises:

means coating said matrix material, and hardening, strengthening, and toughening said matrix material, for enhancing components-release from said filter, whereby said filter is rendered cleanable and reusable; wherein

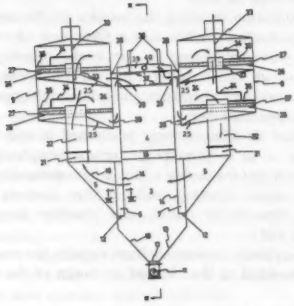
said coating means comprises a filler agent; and

said filler agent comprises means for gettering carcinogenic and like harmful vapors and/or particulates borne by said gas streams by altering said carcinogenic and like vapors and/or particulate chemical reactivity or changing the chemical structure thereof.

4,227,900
APPARATUS FOR FILTERING GAS STREAMS

John T. Nichols, and Horace S. White, both of 15 Metropolitan Ave., Nunawading, 3131, Victoria, Australia

Filed Dec. 9, 1977, Ser. No. 859,162
Int. Cl.[2] B01D *46/30, 46/46*
U.S. Cl. 55—288 10 Claims



1. Apparatus for separating particles from a gas stream, comprising:

(a) a common manifold for carrying a gas stream containing particles to be separated, said common manifold extending along a longitudinal axis of said apparatus;

(b) sole conveyor means operatively connected to said common manifold for conveying away particles separated from said gas stream;

(c) baffle particle separator means in communication with said common manifold means for separating particles from said gas stream;

(d) further particle separator means for separating particles from said gas stream issuing from said common manifold, said further particle separator means being in communication with said baffle particle separator means via a duct means for transporting said gas stream between said baffle particle separator means and said further particle separator means, said further particle separator means including a filter bed support and a filter bed of particulate material supported on said support; and

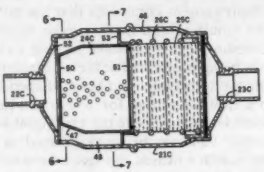
(e) backwashing means operatively connected to said further particle separator means for removing particles from said further particle separator means to give backwashed particles, by passing backwashing gas through said further particle separator means in a direction opposite to the direction of the flow of said gas stream through said further particle separator means for separating particles from said gas stream;

said baffle particle separator means defining sidewalls of said common manifold, said common manifold being in direct communication with said duct means, whereby re-entrainment in said duct means and said further particle separator means of particles separated from said gas stream is substantially prevented.

4,227,901
FILTER-DRIER FOR HEAT PUMP SYSTEMS

Harold T. Lange, St. Louis, Mo., assignor to Sporlan Valve Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 789,360, Apr. 21, 1977, Pat. No. 4,104,044, which is a continuation-in-part of Ser. No. 729,670, Oct. 5, 1976, Pat. No. 4,029,580. This application Jul. 26, 1978, Ser. No. 928,234
Int. Cl.[2] B01D *27/02, 35/02, 53/04*
U.S. Cl. 55—301 1 Claim



1. A filter-drier unit for heat pump systems, comprising:

(a) a housing provided with an inlet and outlet,

(b) desiccant in the housing between the inlet and outlet,

(c) flow-directing means including:

1. a fine mesh screen in the housing between the inlet and desiccant for enabling a first flow from the inlet through the screen and desiccant,

2. a passage bypassing the desiccant for enabling a second flow from the inlet through the passage, and

3. the fine mesh screen collecting desiccant fines upon any reverse flow for precluding migration of desiccant out of the inlet,

(d) the fine mesh screen is located relative to the inlet and bypass passage so that the second flow engages and moves past the screen for washing the screen and passing any dirt from the screen into and through the bypass passage,

(e) a filter means is located in the housing between the desiccant and outlet for receiving the first flow through the desiccant and for receiving the second flow including any dirt washed from the screen from the bypass passage prior to movement through the outlet, the bypass passage enabling reverse flow from the filter means to the inlet,

(f) a holder containing the desiccant, the holder being spaced

peripherally from the housing to provide the bypass passage therebetween,

(g) the fine mesh screen extends across the holder upstream of the desiccant and is spaced axially from the inlet to provide a space between the inlet and screen, and

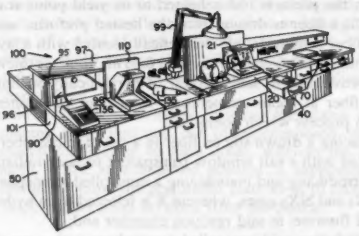
(h) the bypass passage communicates with the space between the inlet and screen so that the second flow engages and moves past the screen for washing the screen.

4,227,902

BENCH STRUCTURE WITH DUST COLLECTOR

Donald F. Olson, St. Charles, Ill., assignor to St. Charles Manufacturing Co., St. Charles, Ill.

Filed Aug. 8, 1977, Ser. No. 823,049
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **7 Claims**



4. A laboratory bench assembly for the collection of dust resulting from grinding or polishing operations in lathe and hand grinding operations conducted at said bench assembly, said bench assembly including a frame, an enclosed bench, a countertop, an exhaust means, a blower means for creating an air flow between said exhaust means and said blower means, filter means intermediate said blower means and said exhaust means for cleaning said air flow, said exhaust means being connected to said filter means by conduit means when exposed by said open position of said countertop portion, said air flow thereby carrying said dust particles from said grinding operation at said bench through said conduit means to be collected in said filter means, said exhaust means including a first exhaust compartment and a second exhaust compartment, said first exhaust compartment having a first vent opening, said second exhaust compartment having a second vent opening and mounted to said first exhaust compartment in telescopic fashion to allow said exhaust compartment to move from a retracted position where said first vent opening is open for the flow of air and said second vent opening is closed to the flow of air, to an extended position where said second vent opening is closed to the flow of air and said first vent opening is open to the flow of air.

4,227,903

FILTER CELL APPARATUS

Karl-Axel G. Gustavsson, and Holger A. Persson, both of Enköping, Sweden, assignors to AB Bahco Ventilation, Stockholm, Sweden

Filed Aug. 31, 1978, Ser. No. 938,720
Claims priority, application Sweden, Aug. 31, 1977, 7709819
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **5 Claims**

1. A compact cell filter apparatus comprising:

a housing;

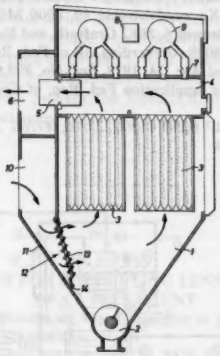
at least one filter cell in said housing having a gas flow direction;

a dust chamber adjacent to, and communicating with, the upstream end of said at least one cell;

a raw gas duct on said housing, said gas flow direction being from said raw gas duct towards said at least one filter cell, said raw gas duct being adjacent to, and communicating with, the upstream end of said dust chamber, said raw gas duct including a boundary wall at its downstream end;

filter cleaning means communicating with the downstream end of said at least one cell, said filter cleaning means including gas blast means for providing gas blast shocks in a direction opposite that of said gas flow direction;

gas deflector means located between said dust chamber and said raw gas duct, said gas deflector means and said boundary wall together forming a tapering duct for supplying raw gas from said raw gas duct to said dust chamber, one of said gas deflector means and said boundary wall being at least partially movable in response to said gas blast shocks, said tapering duct narrowing to a passage whose width varies in response to the movement of said one of said gas deflector means and said boundary wall, whereby said movement of said one of said gas deflector means and said boundary wall helps remove dust particles from said passage.

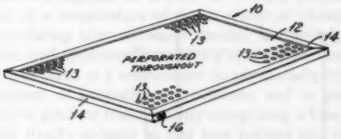


4,227,904

GAS PHASE PERMEABLE FILTER

James W. Kasmark, Jr., Mount Clemens; Myron L. Dooley, New Baltimore, and Arthur H. Jones, Marine City, all of Mich., assignors to D-Mark, Inc., Mt. Clemens, Mich.

Continuation of Ser. No. 709,665, Jul. 29, 1976, abandoned. This application Sep. 8, 1978, Ser. No. 940,721
Int. Cl.[3] B01D *50/00*
U.S. Cl. 55—316 **15 Claims**



15. A gas phase permeable filter comprising:

a plurality of self-supporting perforated sheet substrates assembled in confronting spaced apart face-to-face relation having discrete perforations, each of said confronting faces having disposed upon it a uniform layer of odor-adsorbing media consisting essentially of discrete odor-removing particles individually bonded by adhesive to its adjacent confronting face such that the layer is held between the spaced apart substrates against settling and displacement, each odor-removing particle having only a minor portion of its surface in contact with the adhesive and a major portion upstanding from the substrate face and free of adhesive so to form a thickness of odor-remov-

ing media between the substrates of approximately two particulate diameters; and

a means for holding said substrates in the aforesaid assembled relation.

4,227,905

PROCESS AND HEAT PUMP FOR THE TRANSFER OF HEAT AND COLD

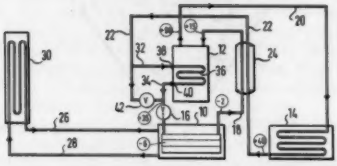
Manfred Burger, Wolfratshauser Strasse 45, 8023 Pullach; Waldeman Dukek, Landsberger Strasse 161, 8000 München; Ernst Gagel, Karwendelstrasse 49, 8000 München 70; Alfred Pretchtl, Lindenweg 6, 8082 Grafrath, and Rudolf Kalmovicz, Stadtweg 25, 8059 Altenerding, all of Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,619

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1977, 2718265

Int. Cl.[2] **F25B** *41/00, 27/02, 47/00, 31/00*

U.S. Cl. 62—113 **5 Claims**



1. Process for the transfer of heat and cold between two separate fluid streams by means of a closed circuit of cooling medium, by which a cooling medium is successively vaporized, compressed, liquified and decompressed and, by heat exchange with the fluid streams, absorbs heat of evaporation and gives off heat of condensation, wherein (a) during heating by a condenser, said cooling medium is heated, prior to its decompression, by the Joule's heat released upon compression, and (b) prior to said heating by said Joule's heat, said cooling medium is cooled by heat exchange with the fluid stream used for vaporization, said fluid stream being simultaneously heated.

4,227,906

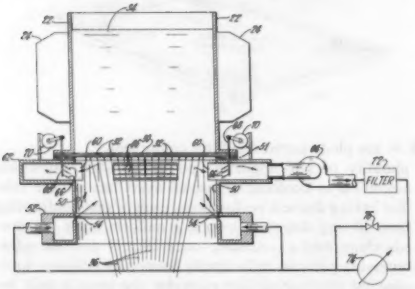
ENVIRONMENTAL CONTROL FOR MINERAL FIBER-FORMING

Elmer P. Rieser, Pickerington, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 9, 1976, Ser. No. 703,722

Int. Cl.[3] **C03B** *37/02*

U.S. Cl. 65—2 **19 Claims**



1. A method of making fibers from molten mineral material comprising:

(a) attenuating fibers from a bushing, said bushing having a bottom wall adapted with a plurality of orifices;

(b) directing a fluid toward said bushing bottom wall from a fluid supply means;

(c) eductING a portion of said fluid from a locus intermediate said bushing bottom wall and said fluid supply means; and,

(d) recovering said fibers.

4,227,907

LASER PHOTOCHEMICAL SYNTHESIS COATING OF OPTICAL FIBER

James A. Merritt, Pulaski, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1979, Ser. No. 87,115

Int. Cl.[3] **C03C** *25/02*

U.S. Cl. 65—3 R **2 Claims**

1. In a method of producing an optical fiber of high mechanical strength from a high purity fused silica preform rod wherein the preform rod is heated to its yield point at about 2000° C., a fiber is drawn from the heated preform, and the drawn fiber is immediately hermetically sealed with a layer of silicon nitride of about 0.02 to about 0.20 micrometer thickness, the improvement in said method of hermetically sealing the drawn fiber at room temperature by a laser photochemical reaction process which comprises:

(a) placing a drawn silicon fiber in a reaction chamber provided with a salt window transparent to laser radiation;

(b) introducing and maintaining a controlled atmosphere of SiX_4 and NX_3 gases, wherein X is selected from hydrogen and fluorine, in said reaction chamber and;

(c) irradiating said controlled atmosphere with a predetermined wavelength of a laser to produce Si_3N_4 which coats and hermetically seals said drawn silicon fiber with a layer of said Si_3N_4 of about 0.02 to about 0.20 micrometer thickness.

4,227,908

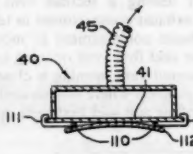
SHAPING GLASS SHEETS BY DROP FORMING WITH SAG CONTROL MEANS

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application Jun. 1, 1979, Ser. No. 44,442

Int. Cl.[2] **C03B** *23/02*

U.S. Cl. 65—106 **18 Claims**



1. A method of shaping glass sheets, comprising the steps of:

heating a glass sheet to approximately its softening point;

bringing a surface of the glass sheet and a flat perforated plate of a vacuum plate into close proximity to each other with a spacing member interposed between the plate and marginal portions of the glass sheet;

drawing a vacuum through the perforated plate so as to retain the glass sheet on the platen and to bring said marginal portions of the glass sheet to bear against the spacing means, whereby the vacuum draws remaining portions of the glass sheet closer to the plate than said marginal portions, thereby bowing the glass sheet;

supporting the platen and the bowed glass sheet carried thereon in an essentially horizontal orientation with the glass sheet under the platen;

bringing into vertical alignment with and beneath the glass

sheet held on the platen a shaping mold having a contour defining the desired contour for the glass sheet; and

releasing the glass sheet from the platen so as to fall onto the shaping mold and conform to the contour defined by the shaping mold.

8. An apparatus for shaping glass sheets comprising;

furnace means for heating glass sheets to a softened condition;

support means adjacent to the furnace means for supporting glass sheets;

conveyor means for transferring glass sheets from the furnace means to the support means;

a platen having a flat perforated plate and having an enclosed interior space in communication with a source of vacuum;

means for transferring the platen into and out of close proximity to the support means so as to lift the glass sheet from the support means by means of vacuum;

spacing means supported before said flat perforated plate so as to be interposed between the plate and marginal portions of a sheet of glass retained on the platen;

a shaping mold having upwardly facing shaping surfaces defining the desired curvature and corresponding to the shape of the glass sheets; and

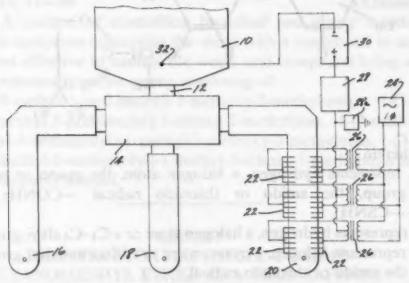
shuttle means for alternately bringing the platen and the shaping mold into and out of superimposed vertically spaced relationship to each other, wherein the shaping mold in the superimposed position is supported at an elevation below the perforated plate so as to receive and shape a glass sheet dropped from the platen.

4,227,909

ELECTRIC FOREHEARTH AND METHOD OF MELTING THEREIN

Emery J. Hornyak, Jr., Temperance, Mich.; Philip D. Perry, Toledo, Ohio, and James E. Sherman, Temperance, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jun. 12, 1979, Ser. No. 47,677
Int. Cl.[2] C03B *5/02*
U.S. Cl. 65—135 **12 Claims**



1. Apparatus for manufacturing molten glass without blisters comprising, in combination:

a melter for melting a glass batch;

a refiner connected to receive molten glass from said melter;

one or more forehearths connected to and fed by said refiner;

a plurality of Joule effect heating electrodes located in at least one forehearth;

AC means connected to said heating electrodes for providing an AC current to said heating electrodes;

DC means, connected to said AC means, for impressing a positive and equal DC signal upon each of said heating electrodes; and

an electrode, located in said melter adjacent the connection to the refiner and connected to the opposite pole of said DC means, for providing a path for electron flow from all of said heating electrodes to said melter electrode.

12. In a method of manufacturing molten glass by means of an apparatus which includes a melter for melting a glass batch, a refiner connected to receive molten glass from the furnace, one or more forehearths connected to and fed by the refiner, and a plurality of Joule effect heating electrodes located in each forehearth wherein an AC signal is provided to said heating electrodes to cause Joule effect heating of molten glass to occur, the improvement comprising the steps of:

impressing a positive and equal DC voltage upon each heating electrode; and

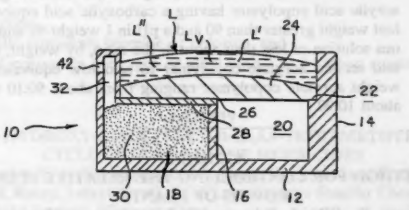
impressing a negative DC voltage upon an electrode which is located in said melter adjacent to the connection to said refiner so as to provide a path for the flow of electrons from the heating electrodes to said furnace electrode and thereby cause free electrons to be collected on said melter electrode and prevent the formation of blisters on the heating electrodes.

4,227,910

APPARATUS FOR SUPPORTING LENSES DURING HEAT TREATMENT

Emil W. Deeg, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 880,839, Feb. 24, 1978, Pat. No. 4,149,868. This application Jan. 25, 1979, Ser. No. 6,328
Int. Cl.[3] C03B *32/00*
U.S. Cl. 65—269 **1 Claim**



1. A fixture for heat sinking a selected portion of an ophthalmic quality lens or lens blank to produce a reversible, progressive local variation in photochromic behavior with a continuous variation in transmissivity from a lens or lens blank which is composed of a potentially phototropic glass containing all the necessary ingredients therein to develop photochromic behavior at a temperature of development of photochromic behavior during heat treatment thereof, during which heat treatment said apparatus maintains a selected portion of said lens or lens blank at a temperature to substantially inhibit the development of photochromic behavior and to produce a progressive gradient transmissivity comprising: a base portion, sidewalls fixedly secured to said base portion and extending generally upwardly therefrom and enclosing a cavity portion; divider means extending upwardly from said base portion between generally opposite sidewalls and separating said cavity portion into two portions; flange means disposed on said sidewalls intermediate said base portion and top of said sidewalls and adapted to receive said lens or lens blank; heat-sinking material disposed in one of said cavity portions, said heat-sinking material having at least one phase transition temperature below the temperature of development of photochromic behavior; and a heat-conducting cover disposed over said one of said cavity portions, one side of said cover being in contact with said heat-sinking material and the other side of said cover being in contact with the selected portion of the lens or lens blank.

4,227,911
WETTING AGENT AND USE THEREOF IN AGRICULTURE

James D. Leonard, Chaska, and Michael J. Lewis, Prior Lake, both of Minn., assignors to Conklin Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 769,314, Feb. 17, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 950,067
Int. Cl.³ A01N *25/00*
U.S. Cl. 71—77 **15 Claims**

1. In an aqueous composition for stimulating root development of plants, which composition comprises a surface-tension lowering surfactant, a water-compatible organic liquid solvent compatible with said surfactant, a polysiloxane foam-suppressing agent, and one root-development stimulating low equivalent weight solid acrylate copolymer, comprising monomeric units derived from acrylic acid, α-lower alkyl acrylic acid or mixtures thereof, and an allyl saccharide, said monomeric units derived from said acid or acids being in the acrylate salt form; said acrylate copolymer having a molecular weight in excess of 50,000 and a carboxylic acid equivalent weight greater than 72 but less than about 90, the improvement which comprises improving the essentially non-clogging sprayability characteristics of said aqueous composition by means of an essentially non-clogging additive, said essentially non-clogging additive comprising:

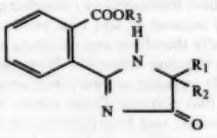
a root-development stimulating, second acrylate copolymer uniformly distributed through said aqueous composition, said second acrylate copolymer being a solid, relatively higher equivalent weight acrylic acid copolymer, comprising monomeric units derived from acrylic acid or α-lower alkyl acrylic acid or mixtures thereof, and a lower alkyl acrylate or lower alkyl α-lower alkyl acrylate or mixtures thereof, said relatively higher equivalent weight acrylic acid copolymer having a carboxylic acid equivalent weight greater than 90 and a pH in 1 weight-% aqueous solution of less than about 4; the ratio, by weight, of said second acrylate copolymer to said low equivalent weight acrylate copolymer ranging from about 90:10 to about 10:90.

4,227,912
METHOD FOR CONTROLLING THE RELATIVE STEM GROWTH OF PLANTS

Thomas D. O'Neal, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 871,874, Jan. 23, 1978, Pat. No. 4,170,462. This application Mar. 30, 1979, Ser. No. 25,511
Int. Cl.³ A01N *43/50*
U.S. Cl. 71—78 **4 Claims**

1. A method for eliminating and/or inhibiting bud growth on coffee or tobacco plants comprising, applying to the foliage of said plants or to soil in which they are growing, a bud growth inhibiting amount of a compound having the formula:



wherein R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, or when R_1 and R_2 are taken together with the carbon to which they are attached they may represent cycloalkyl C_3–C_6 optionally substituted with methyl; R_3 is hydrogen, alkyl C_1–C_{12}, alkenyl C_3–C_5 optionally substituted with one halogen substituent or one or two methyl substituents, benzyl, cyclohexenylmethyl, pentadienyl, or a salt-forming cation selected from the group consisting of alkali metals, ammonium and aliphatic ammonium; and the acid addition salts thereof.

4,227,913
INHIBITING PLANT BUD GROWTH WITH SUBSTITUTED 2,6-DINITROANILINES

Robert H. Kupieian, Bucks County, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 439,193, Feb. 4, 1974, Pat. No. 4,123,250, which is a continuation-in-part of Ser. No. 245,646, Apr. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,538, Jun. 30, 1971, abandoned. This application Aug. 17, 1978, Ser. No. 934,442
Int. Cl.³ A01N *43/36, 33/06, 41/00*
U.S. Cl. 71—78 **6 Claims**

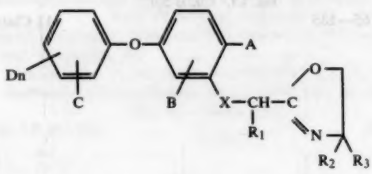
1. A method for inhibiting bud growth on plants comprising contacting the plants with a bud growth inhibiting amount of the compound [N-sec-butyl-2,6-dinitro-3-methyl-4-(methylsulfonyl)aniline] N-sec-butyl-4-methylsulfonyl-2,6-dinitro-m-toluidine, 1-(2,6-dinitro-3,4-dimethylphenyl)pyrrolidine or 4-methylsulfonyl-2,6-dinitro-N-(3-pentyl)-m-toluidine.

4,227,914
HERBICIDAL PHENOXYALKYLOXAZOLINES

Werner Föry, Basel; Beat Böhner, Binningen; Dieter Dürr, Bottmingen, all of Switzerland; Georg Pissiotas, Lörrach, Fed. Rep. of Germany; Otto Rohr, Therwil, and Henry Szczepanski, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 19, 1979, Ser. No. 4,961
Claims priority, application Switzerland, Jan. 25, 1978, 804780/78
Int. Cl.² A01N *9/22*; C07D *263/14*
U.S. Cl. 71—88 **11 Claims**

1. Phenoxyalkyloxazolines of the formula I



wherein

A represents hydrogen, a halogen atom, the cyano or nitro group, the amido or thiamido radical —$CONH_2$ or —$CSNH_2$,

B represents hydrogen, a halogen atom or a C_1–C_4 alkyl group,

C represents halogen, a cyano, nitro or trifluoromethyl group, the amido or thiamido radical,

D represents a halogen atom, the cyano or nitro group,

n is 0, 1 or 2,

R_1, R_2 and R_3, each independently of the other, represents hydrogen or a C_1–C_4 alkyl group, and

X represents oxygen or sulfur.

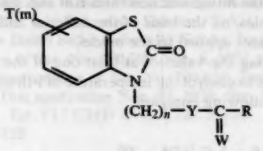
4,227,915
N-SUBSTITUTED OXOBENZOTHIAZOLINE AND OXOBENZOXAZOLINE DERIVATIVES AND THEIR USE AS PLANT GROWTH REGULANTS

John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 18, 1978, Ser. No. 907,233
Int. Cl.² A01N *9/12*
U.S. Cl. 71—90 **5 Claims**

1. A method of regulating the natural growth and development of leguminous plants which method comprises applying

to said leguminous plants or their habitat an effective plant growth regulating amount of a compound of the formula



wherein Y and W represent independently oxygen or sulfur; T represents lower alkyl, lower alkoxy, CF_3 or NO_2; m is an integer of from 0 to 1; n is an integer of from 1 to 3; and R is selected from the group consisting of

morpholino, pyrrolidyl and pyrrolidyl substituted by from 1 to 2 lower alkyl, lower alkenyl or lower alkoxy moieties; R_1 represents lower alkyl, lower alkenyl, benzyl, phenyl or phenyl substituted by from 1 to 3 lower alkyl, lower alkoxy, lower alkenyl, CF_3 or NO_2 moieties; R_2 represents hydrogen, lower alkyl or lower alkenyl moieties.

4,227,916

CONTROL OF WEEDS WITH 1-(3-METHYL-5-ISOTHIAZOLYL)-3-ALKOXYL-3-METHYLUREAS

Dennis K. Krass, Canal Fulton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 848,174, Nov. 4, 1977. This application Aug. 30, 1979, Ser. No. 71,170

Int. Cl.² A01N 9/12

U.S. Cl. 71—90 **6 Claims**

1. A method of controlling broadleaf and grassy weeds which comprises contacting the weed with a compound in an amount effective to control the weed, said compound being a urea selected from the group consisting of:

1-(3-methyl-5-isothiazolyl)-3-methoxy-3-methylurea, 1-(3-methyl-5-isothiazolyl)-3-ethoxy-3-methylurea, 1-(3-methyl-5-isothiazolyl)-1-methyl-3-methoxy-3-methylurea, 1-(3-methyl-5-isothiazolyl)-1-methyl-3-ethoxy-3-methylurea or mixtures thereof.

4,227,917

PHENYLGLYOXYLONITRILE-2-OXIME-CYANOMETHYL ETHER AS A CROP SAFENER

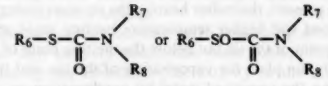
Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 772,700, Feb. 28, 1977, Pat. No. 4,152,137, which is a continuation-in-part of Ser. No. 717,792, Aug. 25, 1976, Pat. No. 4,070,389. This application Mar. 26, 1979, Ser. No. 23,805

Int. Cl.² A01N 9/12, 9/20

U.S. Cl. 71—100 **9 Claims**

1. A method for protecting crops from injury caused by application of a herbicidal thiocarbamate of the formula



wherein

R_6 is lower alkyl, lower alkenyl, chloroallyl, dichloroallyl, trichloroallyl or p-chlorobenzyl,

R_7 is lower alkyl having at least 2 carbon atoms, and

R_8 is lower alkyl having at least 2 carbon atoms or cyclohexyl or wherein

R_7 and R_8 together with the nitrogen atom form the hexahydro-1H-azepin ring or the decahydroquinoline or 2-methyl-decahydroquinoline ring,

said method comprising applying to the crop seeds, a crop protecting amount of phenylglyoxylonitrile-2-oxime-cyanomethyl ether.

4,227,918

NOVEL HALOGENOETHYL SULPHONES AND THEIR USE AS PLANT GROWTH REGULATORS

Wolfgang Hofer, Wuppertal, and Klaus Lürssen, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

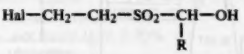
Division of Ser. No. 856,056, Nov. 30, 1978. This application Dec. 4, 1978, Ser. No. 965,966

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657380

Int. Cl.² A01N 9/14

U.S. Cl. 71—103 **8 Claims**

1. A method of regulating the growth of plants which comprises applying to the plant or to a habitat thereof, a plant growth regulating amount of a compound having the formula



wherein

Hal represents bromine or chlorine, and

R represents hydrogen or alkyl with 1 to 4 carbon atoms.

4,227,919

1-HYDROXY-2-(ALKYLKETO)-4,4,6,6-TETRAMETHYL CYCLOHEXEN-3,5-DIONE HERBICIDES

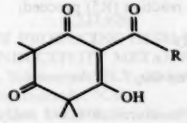
Reed A. Gray, Saratoga; Chien K. Tseng, El Cerrito, and Ronald J. Rusay, Lafayette, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 947,217, Sep. 29, 1978. This application Aug. 6, 1979, Ser. No. 64,243

Int. Cl.² A01N 9/24

U.S. Cl. 71—122 **4 Claims**

1. A method of controlling undesirable vegetation comprising applying thereto a herbicidally effective amount of a compound having the formula



wherein R is alkyl having 1 to 6 carbon atoms.

4,227,920

METHODS OF CLAY BENEFICATION

John H. Chapman, Sandersville, Ga., and David Anderson, Elizabeth, N.J., assignors to Yara Engineering Corporation, Springfield, N.J.

Filed Jul. 18, 1978, Ser. No. 925,867

Int. Cl.² C04B 33/13

U.S. Cl. 75—1 R **13 Claims**

1. A method of beneficiating highly discolored clays to

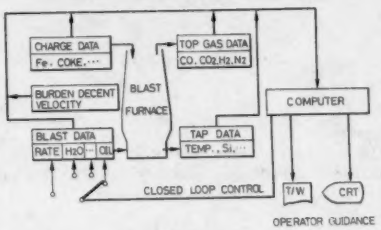
produce a clay of acceptable quality to the paper industry comprising the steps of:

a. forming an aqueous suspension of a clay to be beneficiated,
b. deflocculating said aqueous clay suspension,
c. first, passing said deflocculated clay suspension through a high intensity magnetic separator,
d. further deflocculating said clay after passing through said magnetic separator,
e. second, selectively flocculating the clay from the suspension after it has passed through said high intensity magnetic separator,
f. removing the supernatant liquid from the flocculated clay, and
g. recovering a clay of improved whiteness and brightness from said selectively flocculated clay.

4,227,921
METHOD OF CONTROLLING A BLAST FURNACE OPERATION

Yoshiyuki Matoba, and Koichi Otsuka, both of Amagasaki, Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 12, 1979, Ser. No. 11,617
Claims priority, application Japan, Feb. 27, 1978, 53-22454
Int. Cl.³ C21B *5/00*
U.S. Cl. 75—41 **7 Claims**



1. A method of controlling blast furnace operation by changing the value of the following manipulating variables: oil injection rate, blast moisture, blast oxygen rate, blast rate, blast temperature and ore/coke ratio, the method comprising:

(A) assuming a process model on the basis of the following conditions:
(1) the working volume in the furnace is vertically subdivided into a plurality of horizontal zone,
(2) in each zone, predetermined reactions proceed uniformly, and
(3) said horizontal zones include a zone at the lower side in which carbon solution reaction (R4) and pig iron production reaction (R5) proceed;

$$C+CO_2 \rightarrow 2CO \quad (R4)$$

$$FeO+CO \rightarrow Fe+CO_2 \quad (R5)$$

(B) conducting measurements and analyses to obtain the following process data: the charge data, top gas data, blast data and tap data.
(C) predicting the future temperature Ti of the i-th zone by the steps of:
(1) calculating the reaction rates R4 and R5 at present from said process data,
(2) predetermining the step response characteristic of the reaction rates R4 and R5 when changing the values of the maniplating variables,
(3) calculating the future reaction rates R4 and R5 from the present reaction rates R4 and R5 and said step response characteristics,
(4) calculating the other future reaction rates Rm from the future reaction rates R4 and R5 and the manipulating variables,
(5) calculating the future temperature Ti of the i-th zone from the future reaction rates Rm and the manipulating variables, on the basis of the material and heat balance equations applied to the model,
(D) changing the value of at least one of the manipulating variables to control the temperature of i-th zone according to the following equation:

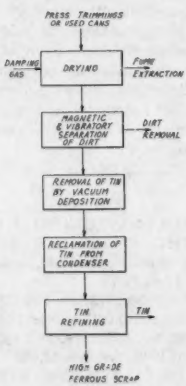
$$U^* = U^0 + \sum_j G_{ij} (Ti^* - Ti^j)$$

where
U^*: value of manipulating variable after change
U^0: value of manipulating variable at present time
G_{ij}: coefficient
Ti^*: target temperature of i-th zone
Ti^j: predicted temperature of i-th zone at future time j.

4,227,922
MATERIAL SEPARATION

William R. Laws, Worcester Park, and Geoffrey R. Reed, Shepperton, both of England, assignors to Encomech Engineering Services Ltd., Hounslow, England

Filed May 31, 1978, Ser. No. 911,224
Claims priority, application United Kingdom, Jun. 9, 1977, 24231/77
Int. Cl.² C22B *15/00*
U.S. Cl. 75—64 **8 Claims**



1. A process for removing tin from scrap or waste tin plate comprising the steps of initially subjecting the tin plate to a first low temperature heating stage in a current of gas to remove moisture present, thereafter heating the tin plate under vacuum to a second and higher temperature heating stage above the melting point of the tin but below the melting point of the steel base of the tin plate for vaporisation of the tin, and thereafter recovering the vaporised metal by condensation on a cooled surface for collection.

4,227,923

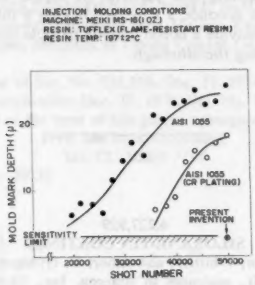
PLASTIC MOLDING STEEL HAVING IMPROVED RESISTANCE TO CORROSION BY HALOGEN GAS

Toshiyuki Watanabe, Nishio; Hisao Kamiya, Kariya; Noriyoshi Shibata, Chita, and Takayoshi Shimizu, Tokai, all of Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 830,789, Sep. 6, 1977, abandoned, which is a continuation of Ser. No. 700,030, Jun. 25, 1976, abandoned. This application Nov. 27, 1978, Ser. No. 964,050

Int. Cl.[2] C21D 9/00; C22C 39/20

U.S. Cl. 75—125 4 Claims



1. A massive martensite steel for a mold for plastic molding consisting of up to 0.05% carbon, up to 1.0% silicon, up to 2.0% manganese, 5.0–8.0% nickel, 11.0–15.0% chromium, 1.0–4.0% molybdenum, 0.5–4.0% copper, 0.5–2.0% cobalt, at least one machinability-improving component selected from the group consisting of 0.03–0.30% lead, 0.01–0.20% tellurium, 0.002–0.020% calcium, and 0.03–0.40% bismuth, at least one toughness and hardenability-improving component selected from the group consisting of up to 3.0% tungsten, up to 0.01% boron, up to 0.5% titanium, up to 0.5% vanadium, up to 0.5% niobium, and up to 0.5% tantalum, and the balance iron and inevitable impurities, which exhibits a hardness of H_RC 30 or higher after age-hardening treatment at 450°–550° C. and resistance to corrosion by halogen gas.

4,227,924

PROCESS FOR THE PRODUCTION OF VERMICULAR CAST IRON

Sundaresa V. Subramanian, Hamilton; Debabrata S. Ghosh, Ottowa, both of Canada; John M. Gray, Stamford, Conn.; David A. R. Kay, Burlington, and Gary R. Purdy, Hamilton, both of Canada, assignors to Microalloying International, Inc., Stamford, Conn.

Filed May 18, 1978, Ser. No. 907,005

Int. Cl.[2] C22C 33/08

U.S. Cl. 75—130 R 9 Claims

1. Process for producing vermicular cast iron comprising:

(i) forming a near eutectic melt having a sulfur content less than 0.025% by weight;

(ii) admixing at least one rare earth-containing additive with said melt to form stable rare earth oxysulfides thereby reducing the Henrian sulfur activity in the melt to between about 0.004 and 0.035; and

(iii) thereafter allowing said melt to solidify.

4,227,925

HEAT-RESISTANT ALLOY FOR WELDED STRUCTURES

Yuzo Hosoi; Noboru Shinoda, both of Tokyo; Yutaka Tsuchida, Kawasaki; Shozo Sekino, Kitakyushi; Mizuo Sakakihara, Munakata, and Shoji Murota, Kitakyushi, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 832,671, Sep. 12, 1977, abandoned, which is a continuation-in-part of Ser. No. 548,878, Feb. 10, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 886,655

Claims priority, application Japan, Sep. 6, 1974, 49-102644

Int. Cl.[2] C22C 19/05

U.S. Cl. 75—171 2 Claims

2. A heat-resistant alloy for welded structures consisting of:

C: 0.01–0.20%

Si: not more than 0.50%

Mn: not more than 0.50%

Cr: 10 to 25%

B: not more than 0.030%

Zr: not more than 0.50%

Mo+½W: 5 to 20%

W: 10 to 20% when Mo is less than 10%

Mo: 10 to 16 % when W is 3 to 10%

Y: 0.001 to 0.04%

Al: not more than 2.0%

Ti: not more than 1.0%

with the balance being Ni and unavoidable impurities wherein Y_E is defined in the equation

$$Y_E=[Y]\%+1/5[Zr]\%-1.85[S]\%-3.7[O]\%$$

wherein [Y], [Zr], [S], and [O] represent the amount of those respective elements present in the alloy on a weight basis, is in the range from about −0.01 to 0.02%, the alloy possesses a creep rupture strength of more than about 300 hours and wherein the amount of tungsten and molybdenum is within the area defined by the points a, b, c, d, e, and f of FIG. 3 hereof.

4,227,926

METHOD FOR PRODUCING HIGH DENSITY AND HIGH CONDUCTIVITY METAL PRESSINGS

Harold H. Hirsch, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 24, 1978, Ser. No. 954,208

Int. Cl.[2] B22F 3/00, 3/26, 3/12

U.S. Cl. 75—200 12 Claims

12. A method for improving the conductivity and density of pressed and sintered normally soft and reducible metal parts comprising treating a normally soft and reducible metal pressing having open pores with an impregnant that keeps the pores of the pressing open until substantially all internal gasses are expelled and which itself can then be expelled at elevated temperature, removing the impregnant by subjecting the pressing to a sintering schedule comprising raising the temperature in stages, wherein the sintering schedule comprises a first stage at a temperature of between about 50° C. and about 150° C. for a period of from about 5 minutes to about 30 minutes, a second

stage at a temperature of between about 150° C. and about 450° C. for a period of from about 5 minutes and about 30 minutes, a third stage at a temperature of between about 450° C. and about 700° C. for a period between about 5 minutes and about 30 minutes, and a fourth stage at a temperature of between about 850° C. and about 1050° C. for a period between about 30 minutes and about 2 hours.

4,227,927

POWDER METALLURGY

Herbert L. Black, Eighty Four; Mark Somerville, Holbrook, and Jerome Schwertz, Bethel Park, all of Pa., assignors to Cyclops Corporation, Universal-Cyclops Specialty Steel Division, Pittsburgh, Pa.

Filed Apr. 5, 1978, Ser. No. 893,276
Int. Cl.[3] B22F 3/14
U.S. Cl. 75—225 8 Claims

1. A process for consolidating powder metals comprising the steps for

(a) placing unconsolidated powder metal in a sealable glass mold which becomes plastic upon heating,

(b) evacuating the atmosphere from the powder filled mold,

(c) sealing the mold,

(d) placing the mold in an open top refractory container and packing with free flowing refractory powder selected to freely flow at all the temperatures encountered in the process,

(e) heating the mold and contents of the mold to a temperature at which sintering of the powder metal takes place and holding at this temperature for a time sufficient to cause substantially complete densification of the powder metal,

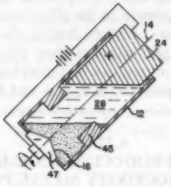
(f) cooling and removing the mold to recover a dense article, and whereby the glass mold is supported by the free flowing refractory powder as the mold becomes plastic and shrinks in volume as its contents densify.

4,227,928

COPPER-BORON CARBIDE COMPOSITE PARTICLE AND METHOD FOR ITS PRODUCTION

Chih-Chung Wang, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,843
Int. Cl.[2] B22F 5/00, 3/00; C22C 29/00
U.S. Cl. 75—238 11 Claims



1. A process for encapsulating particulate boron carbide core materials within copper metal to produce discrete particles suitable for use in fabricating boron carbide core material-filled copper structures having a selected copper/boron carbide core material volume ratio, said process comprising the steps of:

(A) placing the particulate boron carbide core material in a copper containing solution suitable for electroless copper plating and electrolessly plating an electrically conductive film of copper metal on said boron carbide core material to produce copper coated boron carbide particles;

(B) electrolytically depositing additional copper onto said copper coated boron carbide particles; and

(C) terminating the electrodeposition when particles of copper coated boron carbide having a selected copper/boron carbide core material volume ratio is achieved.

5. A process for producing a neutron absorbing, shield structure, said process comprising the steps of:

(A) placing a particulate boron carbide core material in a copper containing solution suitable for electroless copper plating and electrolessly plating an electrically conductive film of copper metal on said boron carbide core material to produce copper coated boron carbide particles;

(B) electrolytically depositing additional copper onto said copper coated boron carbide particles;

(C) terminating the electrodeposition when particles of copper coated boron carbide having a copper/boron carbide core material volume ratio between the range of 0.3 to 4 is achieved; and,

(D) consolidating said particles of copper coated boron carbide to produce a structure having a thickness sufficient to provide a boron carbide particle intercepting all lines passing therethrough.

4,227,929

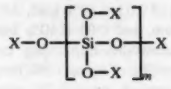
SILOXANE-TIN COATINGS

Gabriel H. Law, Whittier, and Albert P. Gysegem, Monrovia, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.

Division of Ser. No. 718,149, Aug. 26, 1976, Pat. No. 4,080,190.
This application Dec. 8, 1977, Ser. No. 858,708
Int. Cl.[2] C09D 5/14, 5/38
U.S. Cl. 106—1.17 13 Claims

1. A one-package system for preparing an antifouling coating for marine surfaces comprising:

(a) a hydrolyzable siloxane for forming a solid binder, the siloxane having the formula:



where m is from 1 to about 10,
where each X is independently selected from the group consisting of alkyl and alkoxyalkyl radicals containing less than about 6 carbon atoms and Y,
where Y has the formula:

where R_1, R_2, and R_3 are independently selected from the group consisting of alkyl and cycloalkyl radicals, where R_1, R_2, and R_3 contain in combination up to about 18 carbon atoms, the siloxane in the kit being capable of hydrolysis and cross-linking polycondensation to form a solid film, and
where the X's are selected so the ratio of tin atoms to silicon atoms in the siloxane is from about 1:50 to about 2:5;

(b) an acid source of protons sufficient to create an acid condition; and

(c) a filler nondeleteriously reactive with the source of protons.

4,227,930

BALL POINT PEN, INK, AND ITS ERADICATOR SYSTEM

An-Chung R. Lin, Fairport, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 784,653, Apr. 4, 1977, Pat. No. 4,156,657.
This application Nov. 13, 1978, Ser. No. 960,360
Int. Cl.[3] G09D *11/18*
U.S. Cl. 106—19 3 Claims

1. A colored ink which can be eradicated after application, consisting of:

a dye which remains colored in acid solution,

a vehicle solution in which the dye will dissolve, and

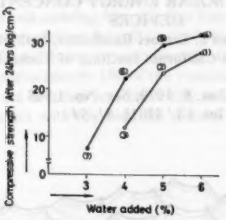
an acid with a PKa value smaller than 7.

4,227,931

SELF-HARDENING MOLD SAND

Hiroshi Uchikawa, Funabashi, and Hajime Kato, Yokohama, both of Japan, assignors to Onoda Cement Co., Ltd., Onoda, Japan

Continuation of Ser. No. 535,169, Dec. 23, 1974, abandoned.
This application Dec. 27, 1978, Ser. No. 973,611
The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.
Int. Cl.[2] B28B *7/34*
U.S. Cl. 106—38.35 10 Claims



1. In a mold sand composition comprising a mixture of sand, water, a self-hardening binder and a surface active agent, the improvement comprising: from about 3 to about 6 percent by weight of water based on the sand; from about 2 to about 20% by weight of binder based on the sand, said self-hardening binder comprising a substantially anhydrite sulphate salt and clinker powder containing at least 2% calcium halo-aluminate of $11CaO.7Al_2O_3.CaX_2$, where X is a halogen atom; and the percentage of said surface active agent to sand is from about 0.02 to about 1.0% by weight, said surface active agent comprising b-naphthalene-sulphonic acid-formaldehyde condensate salt as its main component.

4,227,932

SINGLE COMPONENT POTASSIUM SILICATE CEMENT FOR DRY GUNNING

George R. Leah, Lower Burrell, and Robert R. Pierce, Philadelphia, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 21, 1979, Ser. No. 13,107
Int. Cl.[2] C04B *19/04*
U.S. Cl. 106—84 11 Claims

1. A single component potassium silicate cement composition capable of being dry gunited by mixing with water in the nozzle of a concrete gunning machine to produce a quick setting acid-resistant cement comprising the following pulverulent ingredients expressed as percent by weight:

(a) Potassium silicate having an SiO_2/K_2O weight ratio within the range of about 1.8 to 2.5 of SiO_2 to 1 of K_2O, and a water content within the range of 10 to 25%—8 to 24%

(b) At least one acid releasing hardener—1.3 to 10%

(c) At least one acid resistant inorganic filler 66 to 90%

(d) At least one surfactant—0.05 to 2%

(e) At least one coating oil—0.1 to 2%,

the said acid releasing hardener having a lower limiting weight ratio with respect to the potassium silicate of 1 to 6 and an upper limiting weight ratio with respect to the said potassium silicate of 1 to 2.5.

4,227,933

IMPERMEABLE MEMBRANE CONTAINING TRINIDAD LAKE ASPHALT AND METHOD OF ACHIEVING SAME

LeRoy H. McAllister, Jr., R.R. 1, Zionsville, Ind. 46077

Continuation-in-part of Ser. No. 814,688, Jul. 11, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 969,710
Int. Cl.[3] C08L *95/00*
U.S. Cl. 106—281 R 8 Claims

1. An impermeable membrane formed from an asphaltic mixture of petroleum asphalt and aggregate and filler,

in which Trinidad Lake Asphalt is also used in a proportion of 1.0% to 5.5% by weight, of the total membrane composition, thereby achieving a locking effect by the Trinidad Lake Asphalt which locks or holds the aggregate mixture in position, in the substantial absence of asbestos,

the mechanical bearing strength thereby achieved by the particulate matter of the Trinidad Lake Asphalt thereby permitting the use of a softer combination of petroleum asphalt and Trinidad Lake Asphalt to fill the interstices of the aggregate and filler, without using an asphalt hard enough to itself provide that mechanical strength, and thereby achieving a membrane which is pavable and resistant to cracking as well as impermeable and strong.

4,227,934

USE OF ION EXCHANGE RESINS IN PREPARATION OF HIGH SOLID TiO_2 SLURRIES

Earl R. Lawhorne, Savannah, Ga., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 3, 1979, Ser. No. 35,665
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—300 8 Claims

1. A method of reducing the viscosity of a titanium dioxide pigment slurry having more than about 50 percent by weight solids comprising contacting said slurry with an anion exchange resin.

5. A method of reducing the viscosity of a calciner discharge slurry of titanium dioxide comprising contacting said slurry with an anion exchange resin.

4,227,935

HIGH DRY HIDE TiO_2 SLURRIES

David W. Blake; Alberto W. Delgado, and Gerard M. Sheehan, all of Savannah, Ga., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 16, 1979, Ser. No. 12,677
Int. Cl.[2] C09C *1/36*
U.S. Cl. 106—308 B 8 Claims

1. In an aqueous titanium dioxide pigment slurry having high hiding power, a solids content of about 55 to 70 percent by weight, and an effective amount of a dispersing agent, the improvement comprising using undried, unmilled hydroclassified fines as the source of the titanium dioxide wherein said fines pass through a 325 mesh screen and are coated with about 0.3 to 3 percent by weight of hydrous aluminum oxide.

4,227,936

PROCESS FOR THE PRODUCTION OF READILY DISPERSIBLE PIGMENT PREPARATIONS

Günter Osswald, Ludwigsburg, and Willy Gouders, Cologne, both of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 15,523

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808223

Int. Cl.[3] C09C *1/26, 3/04*

U.S. Cl. 106—309 2 Claims

1. A process for the production of readily dispersible pigment preparations with a pigment content of more than 65% by weight, comprising suspending the pigment in water, to form a suspension having a solids content of 25 to 50% by weight, kneading the suspension, heating the pigment suspension while kneading to a temperature of 60° to 70° C., adding to the suspension a cationactive substance and an oleate, adding a binder dissolved in an organic solvent to the suspension while kneading, the water which is expressed from the kneaded suspension and the organic mass obtained thereby is continued to be kneaded and subsequently dried.

4,227,937

ADDITIVE COMPOSITION FOR MAKING DENTAL MATERIALS

Curtis P. Mabie, Thurmont, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 539,236, Jan. 7, 1975, Pat. No. 3,973,970. This application Jun. 23, 1976, Ser. No. 699,202

Int. Cl.[2] C09K *3/00;* B01J *13/00*

U.S. Cl. 106—313 2 Claims

1. Additive composition for use in dental porcelain products, comprising an aqueous solution including 1 to 8% of a colloidal silica and/or alumina sol and 0.5 to 1.25% of a water soluble flux for aiding in maturation and development of bond strength when used in dental porcelain products, which flux is compatible with the colloid used, said flux comprising a combination of boric acid and borax with a weight ratio of boric acid to borax of 0.1–1.5:1.

4,227,938

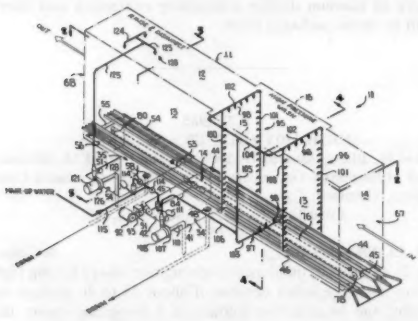
METHOD OF WASHING EGG INCUBATING AND/OR HATCHING TRAYS AND BUGGIES THEREFOR

Douglas Fowler, Gainesville, Ga., assignor to Country Pride Foods Ltd., Eldorado, Ark.

Filed Jun. 13, 1978, Ser. No. 915,234

Int. Cl.[3] B08B *7/04*

U.S. Cl. 134—10 4 Claims



1. A method of washing egg incubating and/or hatching trays and buggies therefor comprising the steps of:

(a) establishing a washing zone within which a plurality of streams of water is directed into said washing zone from above, below and opposite sides;

(b) establishing an egg hatching zone within which eggs are hatched;

(c) transferring buggies and trays soiled by a previous egg hatch from the egg hatching zone of step (b) to the washing zone of step (a);

(d) conveying the buggies with the trays therein through the washing zone of step (a);

(e) collecting wash water drained from the washing zone of step (a);

(f) recycling the wash water colllected in step (e) through said washing zone of step (a);

(g) establishing a rinse zone without which a plurality of streams of rinse water is directed into the rinse zone from above;

(h) collecting rinse water drained from the rinse zone of step (g);

(i) recycling the rinse water collected in step (h) through the rinse zone of step (g);

(j) conveying the buggies with the trays therein directly from the washing zone of step (a) into and through the rinse zone of step (g); and

(k) transferring the trays and buggies from the rinse zone of step (g) back to the egg hatching zone of step (b).

4,227,939

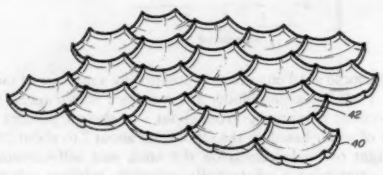
LUMINESCENT SOLAR ENERGY CONCENTRATOR DEVICES

Ahmed H. Zewail, and J. Samuel Batchelder, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 8, 1979, Ser. No. 1,585

Int. Cl.[3] H01L *31/04*

U.S. Cl. 136—247 14 Claims



1. In a light concentration device comprising a transparent substrate having an index of refraction greater than that of the ambient surrounding the device, and having an incident light receiving front surface, a back surface, a light emitting side edge and containing a uniform concentration of at least one efficient fluorescent dye for absorbing said light and reemitting light by fluorescence which travels through said substrate to said edge, the improvement comprising said substrate having a concave front surface and the ratio of the radius of curvature of the back surface to the radius of curvature of the front surface is greater than 1.0.

4,227,940

SOLAR CELL FOR USE IN CONCENTRATOR

Ku Sun Ling, Glendora, and Seksan Khemthong, Whittier, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

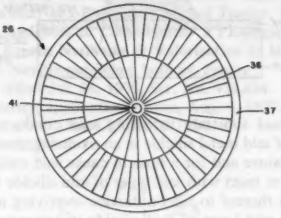
Filed Aug. 21, 1978, Ser. No. 935,526

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—256 5 Claims

1. In a solar cell for use in a concentrator, comprising a generally circular wafer formed essentially of silicon having a base resistivity ranging from 0.5 to 1.5 ohm-centimeter and having back and front surfaces, the wafer having a diameter of approximately 2 inches, a layer of aluminum formed on the

back surface and alloyed into the silicon wafer to form a P+ layer extending through the back surface, an N+ formed in the wafer and extending through the front surface, a multi-layer metal contact structure carried by the back surface making contact to the P+ layer, a multi-layer contact structure carried by the front surface and making contact to the N+ region, said multi-layer contact structure carried by the front surface being formed with a grid line pattern, the grid line pattern being characterized by first and second spaced apart buses extending through substantially 360° and approximately 300 closely



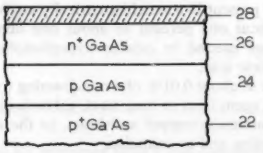
spaced radially extending tapered grid lines, said grid lines being tapered in a direction so that they become narrower in the direction towards the center of said cell, approximately 150 of said grid lines commencing in areas beyond the first and second buses and crossing over the first bus in a direction away from the center of the solar cell toward the outer extremity of the solar cell and being in contact with the first and second buses and approximately 150 of the remaining grid lines commencing at the first bus and extending to the second bus and being in contact with the first and second buses.

4,227,941

SHALLOW-HOMOJUNCTION SOLAR CELLS

Carl O. Bozler, Sudbury; Ralph L. Chapman, Winchester; John C. C. Fan, Chestnut Hill, and Robert W. McClelland, Weymouth, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 889,078, Mar. 22, 1978, abandoned. This application Mar. 21, 1979, Ser. No. 22,405
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—255 **6 Claims**



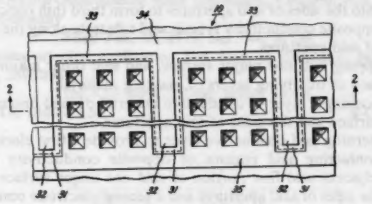
1. A shallow-homojunction photovoltaic device formed from a direct bandgap semiconductor material doped to provide an $n^+/p/p^+$ layered structure, said n^+ layer having a thickness below about 1500 Angstroms thereby allowing significant carrier generation to occur in the p layer upon irradiation of said device with light on the n^+ side.

4,227,942

PHOTOVOLTAIC SEMICONDUCTOR DEVICES AND METHODS OF MAKING SAME

Robert N. Hall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,117
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—255 **19 Claims**



1. A photovoltaic device comprising

a body of cubic symmetry monocrystalline semiconductor material of one conductivity type having a pair of opposite parallel major surfaces, each parallel to a (100) crystallographic plane of said body,

a plurality of recesses in said body, each in the form of a quadrangular pyramid with the base of the pyramid coplanar with one of said pair of major surfaces and extending a uniform distance into said body, each of the sides of the recesses being parallel to a (111) plane of said body of monocrystalline semiconductor material,

a first thin region of opposite conductivity type in said body along the other of said pair of major surfaces of said body,

a second this region of opposite conductivity type in said body along said one major surface of said body,

a plurality of third thin regions of opposite conductivity type, each in said body along the sides of said recesses, each of said third thin regions contacting said first and second thin regions,

a first conductive layer connected to said second and third thin regions of opposite conductivity type,

a second conductive layer connected to said one type conductivity region of said body over a portion of said one major surface.

10. A method of making a photovoltaic device comprising

providing a substrate of cubic symmetry monocrystalline semiconductor material of one conductivity type having a pair of parallel major surfaces, each parallel to a (100) crystallographic plane of said monocrystalline semiconductor material,

providing a first etch mask over one of said pair of major surfaces and a second etch mask over the other of said pair of major surfaces,

forming in said first etch mask a plurality of first openings to expose areas in a first portion of said one major surface, each first opening being identical in form and being bounded by two pairs of parallel opposed edges in said one major surface, each of said pairs of edges being substantially parallel to a respective <110> direction in said one major surface, each pair of parallel edges of each first opening being spaced apart by a distance slightly greater than the distance between said major surfaces multiplied by $\sqrt{2}$,

etching the exposed areas of said substrate with an anisotropic etchant to form a plurality of apertures each in the form of a quadrangular pyramid with the base of the pyramid being coplanar with said one major surface and extending from said one major surface to said other major surface to form a second opening therein substantially smaller than a respective one of said first openings, each of the sides of said apertures being parallel to a (111) plane of said monocrystalline semiconductor material.

removing said first etch mask at least from said first portion of said one major surface,

introducing a first dopant of opposite conductivity type into said other major surface to form a first thin region of opposite conductivity type in said substrate along said other major surface,

introducing a second dopant of opposite conductivity type into said first portion of said major surface to form a second thin region of opposite conductivity type in said substrate along said first portion of said one major surface,

introducing a third dopant of opposite conductivity type into the sides of said apertures to form third thin regions of opposite conductivity type in said substrate along the sides of said apertures,

stripping said one major surface, and said other major surface of overlying layers of masking material,

depositing a layer of conductive material on said one major surface and the sides of said apertures,

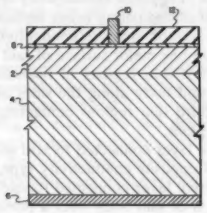
patterning said conductive layer to provide a first electrode contacting said regions of opposite conductivity type adjacent said first portion of said one major surface and the sides of said apertures and a second electrode contacting said substrate of one conductivity type at another portion of said one major surface.

4,227,943

SCHOTTKY BARRIER SOLAR CELL

Marshall J. Cohen, and James S. Harris, Jr., both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 4, 1979, Ser. No. 45,502
Int. Cl.³ H01L *31/04*
U.S. Cl. 136—255 **7 Claims**



1. A Schottky-barrier type solar cell comprising:

an n-type conductivity semiconductor;

an $(SN)_x$ coating less than 300 Å thick on a top surface of said semiconductor, said $(SN)_x$ coating being doped with Br; and

contact means for electrically contacting said semiconductor and said bromine doped $(SN)_x$ coating.

4,227,944

METHODS OF MAKING COMPOSITE CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS

Dale M. Brown; Tat-Sing P. Chow, both of Schenectady, N.Y.; James F. Gibbons, Palo Alto, Calif., and Paul A. McConnelee, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,888
Int. Cl.² H01L *21/283*
U.S. Cl. 148—6 **16 Claims**

1. A method of forming a composite structure comprising

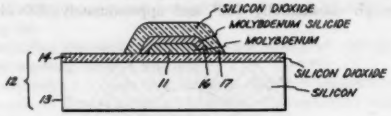
providing a substrate of semiconductor material having an overlying layer of insulating material,

forming a conductor of a refractory metal which is substantially nonreactive with silicon dioxide in a desired pattern overlying said layer of insulating material,

forming over said conductor of metallic material and said layer of insulating material a layer of polycrystalline silicon,

heating said substrate including said conductor of metallic material and said overlying layer of polycrystalline silicon to a temperature and for a time to cause said layer of polycrystalline silicon to react with a portion of said conductor to form a layer of a silicide of said metallic material overlying a remaining portion of said conductor unconverted to a silicide thereof,

removing the portion of said layer of polycrystalline silicon which has not reacted with said metallic material,



heating said substrate including said conductor and said layer of said metal silicide in an oxidizing atmosphere at a temperature and for a time to cause said oxidizing atmosphere to react with said layer of said silicide to convert a portion thereof to silicon dioxide overlying another portion of said layer of said silicide unconverted to silicon dioxide.

4,227,945

METHOD FOR PREVENTING DECARBURIZATION OF STEEL MATERIALS

Minoru Kitayama, and Hisao Odashima, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 6, 1979, Ser. No. 9,966
Claims priority, application Japan, Feb. 10, 1978, 53-14648
Int. Cl.² C23D *1/00*
U.S. Cl. 148—6 **3 Claims**

1. A method for preventing decarburization of a steel material comprising applying a mixture consisting essentially of 10 to 500 parts by weight of metallic aluminum powder per 100 parts by weight of silicon carbide in an amount to give 10 to 1,000 g/m² silicon carbide on the steel material, further applying a solid coating type oxidation inhibitor thereon, and heating the thus coated steel material at a temperature range wherein carburization would normally occur.

4,227,946

NO-RINSE PRE-PAINT COATING COMPOSITION AND METHOD

Stanley C. Williamson, Sea Bright, N.J., assignor to Oakite Products, Inc., Berkeley Heights, N.J.

Filed Feb. 9, 1979, Ser. No. 10,975
Int. Cl.² C23F *7/08, 7/26*
U.S. Cl. 148—6.16 **15 Claims**

1. An acid, aqueous composition containing by weight dissolved in its water:

chromic acid and chromium phosphate as derived from phosphoric acid resulting from the oxidation of hypophosphorous acid in reacting with the chromic acid which latter is present in a stoichiometrically equivalent amount from about one percent to about one hundred percent over that needed to oxidize hypophosphorous acid to phosphoric acid,

from none to about 0.01% of a non-foaming to low foaming wetting agent inert to iron, steel, galvanized iron or steel, zinc, aluminum, copper and brass, to the acidity of the composition and to oxidation;

from none to about seven percent of particulate silica of from about 4 to about 60 millimicrons particle size, and which composition is selected from:

(i) a concentrate with its aforesaid dispersed total solids content being from about two percent to an amount below that at which the composition will gel under its storage conditions; and

(ii) a metal treating bath having as its total dispersed solids

content the amount thereof provided by from about two percent to about fifteen percent by volume of the aforesaid concentrate.

4,227,947

METHOD FOR MODIFYING THE EASY DIRECTION OF MAGNETIZATION OF AN AMORPHOUS MAGNETIC FILM

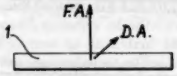
Hubert Jouve, Biviers; Robert Meyer, Gieres; Jacques Sztern, Meudon-la-Forêt; Ramanathan Krishnan, Malakoff; Gabor Suran, Fontenay-aux-Roses, and Michel Tessier, Trappes, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, both of, France

Filed Jul. 28, 1978, Ser. No. 928,836

Claims priority, application France, Aug. 4, 1977, 77 24041

Int. Cl.³ H01F *1/00*

U.S. Cl. 148—122 **2 Claims**



1. A method for modifying the easy direction of magnetization of an amorphous magnetic film of an alloy wherein annealing of said film is carried out in an oxygenfree atmosphere composed of a gas selected from the group consisting of argon, neon, krypton and xenon at a temperature below the temperature of crystallization of the alloy which forms said film, said alloy being in the form of a ribbon fabricated by ultra-rapid quenching from the molten alloy, the magnetic alloy being a transition metal and a metalloid of iron and boron and having the composition $Fe_{80}B_{20}$.

4,227,948

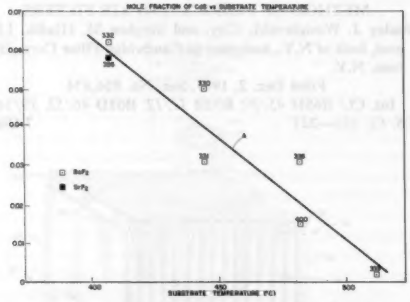
GROWTH TECHNIQUE FOR PREPARING GRADED GAP SEMICONDUCTORS AND DEVICES

James D. Jensen, Highland, and Richard B. Schoolar, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 27, 1977, Ser. No. 864,417

Int. Cl.³ H01L *21/203*

U.S. Cl. 148—175 **35 Claims**



1. A process for preparing from a lead-cadmium chalcogenide alloy having a first composition an epitaxial film having a second composition within a range including the first composition deposited upon an insulating substrate in a vacuum of at least 10^{-4} Torr, comprising:

heating the substrate to a temperature that is a function of the second composition and greater than 350° C.;

maintaining a source of the alloy at a temperature greater than its sublimation temperature; and

exposing the substrate to the source until the epitaxial film is deposited on the substrate.

4,227,949

METHOD AND DEVICE FOR WELDING SUPERIMPOSED STRIPS OF THERMOPLASTIC

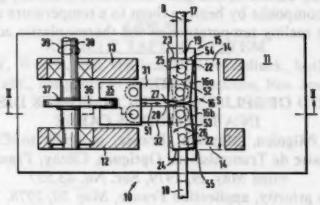
Hubert Wehr, Bornheim-Brenig, Fed. Rep. of Germany, assignor to Cyklop-Gesselschaft, Emil Hoffmann, Cologne, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,735

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2802034

Int. Cl.² B29C *27/08*; B65H *69/06*

U.S. Cl. 156—73.5 **9 Claims**



1. A device for welding superimposed strips of thermoplastic by means of pressure and frictional heat, comprising a stationary friction jaw and an opposed movable friction jaw which move the strips rapidly against one another in their plane under a contact pressure within a limited welding zone, characterized in that the movable friction jaw consists of two jaw sections which extend in the longitudinal direction of the strips, the remote ends of said sections being pivotably mounted on axes perpendicular to the plane of the strips and at one end of the welding zone; and means driving said jaw sections in such a way that their adjacent ends execute pivoting motions of equal magnitude in the same direction.

9. A method of welding together the superimposed portions of thermoplastic strips comprising the steps of pressing said portions into pressure engagement and simultaneously moving said portions laterally relative to each other in decreasing amounts longitudinally in both directions from a point between the ends of the desired weld area.

4,227,950

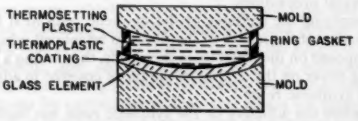
DIRECT CASTING METHOD FOR PRODUCING LOW-STRESS GLASS/PLASTIC COMPOSITE LENSES

Anton A. Spycher, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 848,442, Nov. 4, 1977, abandoned. This application Apr. 5, 1979, Ser. No. 27,231

Int. Cl.² B29D *11/00*; B32B *31/06*

U.S. Cl. 156—85 **4 Claims**



1. A direct casting method for producing an optically clear, optical-distortion-free composite lens comprising a glass element bonded to a high-shrinkage thermosetting plastic element, with low residual stress between the glass and plastic elements, which comprises the steps of:

(a) providing selected surface portions of the glass element with a solid coating of a thermoplastic adhesive having a

heat sealing temperature above the minimum curing temperature of the thermosetting plastic, said coating being solid, of uniform thickness, and essentially non-adhesive with respect to said thermosetting plastic at a curing temperature for said thermosetting plastic;

(b) casting the thermosetting plastic in liquid form against the surface portions of the glass element which have been provided with the coating of thermoplastic adhesive while maintaning the uniform thickness and solid character of said coating of thermoplastic adhesive;

(c) curing the thermosetting plastic by heating the plastic, the glass element and the coating of thermoplastic adhesive to a temperature below the heat sealing temperature of the thermoplastic adhesive but above the minimum curing temperature of the thermosetting plastic; and

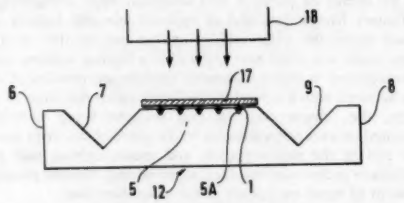
(d) consolidating the cured thermosetting plastic, thermoplastic adhesive, and glass element to a unitary glass-plastic composite by heating them to a temperature above the heat sealing temperature of the thermoplastic adhesive.

4,227,951

METHOD OF SPLICING OPTICAL FIBRES DISPOSED IN A LAYER IN A CABLE

Georges Mignien, Meyzieu, France, assignor to Compagnie Lyonnaise de Transmissions Optiques, Clichy, France

Filed May 29, 1979, Ser. No. 43,537
Claims priority, application France, May 30, 1978, 78 16155
Int. Cl.[2] B65H *69/02*; G02B *5/16*
U.S. Cl. 156—158 **5 Claims**



1. A method of splicing optical fibres which are previously disposed in a layer in a cable such as a layer unrolled into a flat tape configuration, said method including the following steps:

(a) separating the upper and the lower parts of the tape between which the fibres are trapped;

(b) cutting said upper and lower parts and moving them apart along a length which allows a fibre connection zone to be cleared;

(c) laying the fibres to be spliced in positioning V-grooves in a plate;

(d) applying adhesive or synthetic resin to a portion of the fibres to be spliced; and

(e) hardening the adhesive or synthetic resin;

the improvement wherein said method further includes the following steps:

(f) before laying the fibres to be spliced in the positioning V-grooves of the plate, cutting their ends without taking special precautions;

(g) applying the adhesive or the synthetic resin to at least a portion of the length of the fibres to be spliced which are disposed on the plate, up to their ends, then laying a pressing cover on the lengths of the fibres covered in adhesive or synthetic resin;

(h) when the adhesive or the synthetic resin has hardened, sawing the assembly constituted by the plate, the fibres, the adhesive or synthetic resin and the pressing cover at a constant spacing in parallel planes and removing the zone which lies between the sawing planes; and

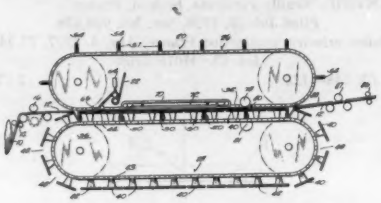
(i) placing the remaining portions of the plate on either side of the sawing planes again end to end, the fibres ends coinciding, interposing a polymerisable liquid or resin with a refractive index close to that of the fibre cores between said coinciding fibre ends, and then pressing the remaining portions of the plate against each other and fixing them in position.

4,227,952

METHOD AND APPARATUS FOR MAKING DIAPERS WITH ELASTIC BANDS

Reinhardt N. Sabee, Appleton, Wis., assignor to Sabee Products, Inc., Appleton, Wis.

Filed Apr. 16, 1979, Ser. No. 30,584
Int. Cl.[2] B32B *31/08*
U.S. Cl. 156—164 **10 Claims**



1. A method for continuously attaching discrete lengths of elastic ribbon to spaced portions of a moving web comprising the steps of:

(a) continuously moving a web of substantially in elastic material through an elastic ribbon applying station;

(b) forming transverse folds at spaced locations along said web;

(c) feeding stretched elastic ribbon to said web;

(d) applying adhesive to the stretched elastic ribbon;

(e) joining the stretched elastic ribbon with adhesive to said web and over the folds;

(f) maintaining the elastic ribbon in a stretched condition until the adhesive sets;

(g) severing the elastic ribbon where the ribbon crosses the folds; and

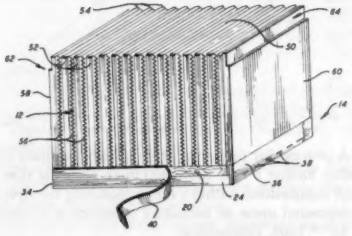
(h) removing the folds from the web to space apart the ends of the severed elastic ribbons and provide web portions without adhered elastic bands to form the waistband portions of the diapers.

4,227,953

METHOD OF FABRICATING AIR FILTERS

Stanley J. Wasielewski, Clay, and Stephen M. Hladik, Liverpool, both of N.Y., assignors to Cambridge Filter Corp., Syracuse, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,674
Int. Cl.[3] B65H *45/20*; B32B *31/12*; B01D *46/52, 39/14*
U.S. Cl. 156—227 **7 Claims**



1. A method of fabricating a high-efficiency air filter unit comprising:

(a) forming a filter core by folding a continuous sheet of

filter media at evenly spaced intervals in accordian fashion, thereby providing a plurality of side-by-side pleats;

(b) forming first and second shallow, pan-like structure from planar sheets of substantially the same rectangular dimensions as the ends of said core formed by the zig-zag pleat edges with four relatively narrow strips, one attached to and extending upwardly from each of the four side edges of said sheets;

(c) filling said first pan-like structure to a predetermined depth with a first quantity of liquid adhesive hardenable to a solid state;

(d) submersing one of said core ends in said first quantity of adhesive within said first pan-like structure to an extent at least sufficient to immerse all of the zig-zag pleat edges of said one end in said liquid adhesive;

(e) allowing said first quantity of adhesive to harden;

(f) filling said second pan-like structure to said predetermined depth with a second quantity of said liquid adhesive;

(g) inverting said core with said first pan-like structure adhered thereto and submersing the opposite of said core ends in said second quantity of adhesive within said second pan-like structure to an extent at least sufficient to immerse all of the zig-zag pleat edges of said opposite end in said liquid adhesive;

(h) allow said second quantity of adhesive to harden; and

(i) assembling a pair of rectangular end plates of substantially the same dimensions as the pleat walls of said filter core in sealing engagement with the endmost pleats of said core and with said planar sheets along adjacent edges of said plates and sheets, thereby forming a four-sided structure enclosing said core in sealing engagement on four sides.

4,227,954

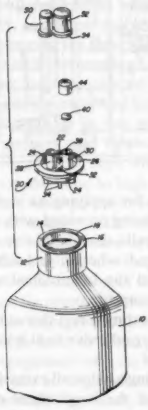
METHOD FOR SEALING CONTAINER CAP PARTS

Gary A. Ward, Round Lake, Ill., and David A. Winchell, Twin Lakes, Wis., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 885,480, Mar. 13, 1978, Pat. No. 4,153,173. This application Nov. 1, 1978, Ser. No. 956,559

Int. Cl.[2] B29D *9/00;* **B29C** *17/00*

U.S. Cl. 156—250 **1 Claim**



1. A method of producing a cap closure for a container comprising the steps of:

molding a unitary member including a base portion and at least one port member on the base portion, said molding including forming plural ribs across said unitary member on a side opposite said port member;

positioning membrane material over said port member;

punching a membrane out of the membrane material with a heated die having a larger area dimension than the port member area;

pressing the punched out membrane on to the top of the port member, whereby the membrane and port member portion adjacent thereto become molten and are fused together and a peripheral lip is formed around the membrane, said rib preventing deformation of said unitary member during said pressing step;

providing a raised island portion surrounding the port member;

positioning a port member protector over the port member with an external flange of the port member protector overlying the island; and

bringing a heated die into thermal contact with the flange and the island to fuse the port member protector to the island and thereby hermetically seal the port member.

4,227,955

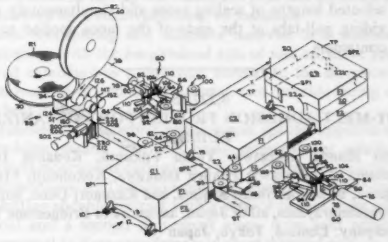
ARTICLE TAPING SYSTEM

Quentin T. Woods, and William D. Gerverdinck, both of San Jose, Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 8, 1979, Ser. No. 1,506

Int. Cl.[2] B31B *1/72, 7/60*

U.S. Cl. 156—269 **12 Claims**



8. An apparatus for sequentially applying segments of sealing tape to a number of containers and for forming pull-tabs on at least one of the ends of each tape segment applied to each container, said apparatus comprising: conveyor means for carrying containers along a path in uniformly spaced relationships; means for indexing the movement of said conveyor means; means for dispensing sealing tape from a roll thereof; roller means arranged to receive said sealing tape from said dispensing means for applying said sealing tape to a leading portion of a container on said conveyor means and for ironing the tape onto said container as said container is carried on said conveyor means; said indexing means being arranged to stop said conveyor means after the sealing tape has been applied to two consecutive containers on the conveyor means to thereby form a linking section of sealing tape extending between the two consecutive containers; means for cutting said sealing tape applied to said two consecutive containers by said roller means; first control means for actuating said cutting means when said conveyor means has been stopped by said indexing means; means for dispensing masking tape from a roll of masking tape; means which receives masking tape from said masking tape dispensing means for feeding the end portion of said masking tape to a position registering with the adhesive side of said sealing tape; second control means for actuating said masking tape feeding means concurrently with the actuation of said means for cutting the sealing tape; means for pressing the end portion of the masking tape against the adhesive side of the sealing tape and for severing the masking tape adjacent the edge of the sealing tape to thereby form a segment of masking tape on the sealing tape; third control means for actuating said pressing and severing means after said feeding means has been actuated; means for mounting said sealing tape cutting means, said roller means, and said masking tape pressing and severing means in fixed relationships relative to each other and to said

conveyor means so as to form masking tape segments on said sealing tape at intervals thereon corresponding to the desired length of the segments of sealing tape to be consecutively formed on said containers, whereby said means for cutting the sealing tape will sequentially cut the sealing tape at a segment of masking tape thereby forming a pull-tab at an end of the sealing tape segments applied to the containers.

11. A method of applying segments of sealing tape of selected uniform lengths to containers and for forming a pull-tab on at least one end of each segment of sealing tape applied to the containers comprising:

dispensing sealing tape from a roll thereof;

applying relatively short segments of masking tape onto the adhesive side of the sealing tape at intervals corresponding to the preselected length of sealing tape to be applied to a container;

applying the sealing tape having a masking tape segment applied thereto to a first container;

cutting the sealing tape at a masking tape segment to form a pull-tab at the end of the sealing tape applied to the first container;

applying the preselected length of sealing tape having the following masking tape segment thereon to a second container; and

cutting the sealing tape at said following masking tape segment, thereby sequentially providing containers with said selected lengths of sealing tapes and simultaneously providing pull-tabs at the ends of the tapes applied to the containers.

4,227,956

HOT-MELT ADHESION PROCESS FOR VULCANIZED RUBBER

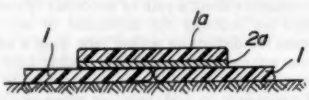
Toshio Honda, Akigawa; Yukio Fukuura, Kodaira; Itsuo Tanuma, Tokorozawa; Hikaru Ishikawa, Kokubunji; Masao Ogawa, Kawagoe; Shozo Kojima, and Kazunori Ueno, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed May 7, 1979, Ser. No. 36,933

Claims priority, application Japan, May 10, 1978, 53-54365

Int. Cl.[2] C09J 3/12

U.S. Cl. 156—334 **2 Claims**



1. A hot-melt adhesion process for vulcanized rubber, comprising hot pressing a first member consisting of a vulcanized rubber composition, whose rubber component contains at least 30% by weight of syndiotactic-1,2-polybutadiene, to a second member comprising a rubber composition defined as the first member or a porous material, such as cloth, paper, leather or wood in the presence of a hot-melt adhesive consisting of a syndiotactic-1,2-polybutadiene thin film interposed between the members.

4,227,957

PROCESS AND APPARATUS FOR MANUFACTURING A NON-WOVEN FABRIC AND THE PRODUCT THEREOF

Herbert W. Keuchel, and George A. Farris, both of Tallmadge, Ohio, assignors to PNC Company, Akron, Ohio

Division of Ser. No. 771,643, Feb. 24, 1977, Pat. No. 4,141,773. This application Jul. 27, 1978, Ser. No. 928,613

Int. Cl.[3] B31F 1/00

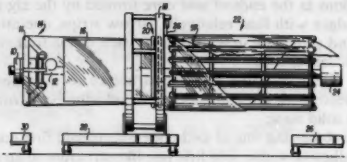
U.S. Cl. 156—443 **16 Claims**

1. Apparatus for providing a thermoplastic web of indeterminated length comprising

means for producing a molten thermoplastic extrudate;

means for forming a tubular web of interconnected filaments from said extrudate;

means for advancing said tubular web along its axis;



means for rotating said web about its axis while it is being advanced; and

means for slitting said web at an angle to the direction of advancement.

4,227,958

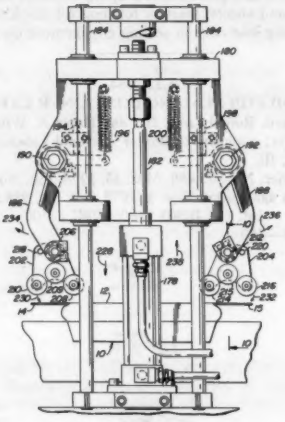
APPARATUS FOR APPLYING AN END CAP TO A CLOTH BOARD REEL

Samuel Louden, Cinnaminson, N.J., assignor to National Tube and Reel Corporation, Delran, N.J.

Filed May 29, 1979, Ser. No. 42,829

Int. Cl.[2] B29C 17/00

U.S. Cl. 156—443 **17 Claims**



1. An apparatus for applying an end cap to a cloth board reel, said end cap being provided with a front wall and a pair of articulated sidewalls, one of said side walls having a sidewall extension at each end, wherein said sidewall extensions are to be wrapped around the longitudinal edges of said reel for bonding thereto, comprising:

means for transporting a reel through the apparatus;

means for applying adhesive to at least one of the surfaces to be bonded; and

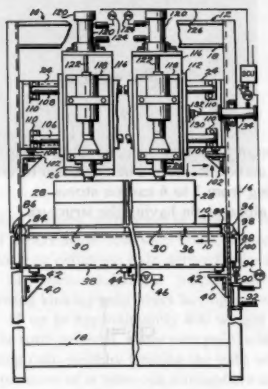
means for wrapping a sidewall extension on each side of said end cap around the longitudinal edge of said reel, said wrapping means including a frame having pivotally mounted thereto a pair of spaced roller mechanisms, each of said roller mechanisms being comprised of three rollers arranged in an arcuate path, said frame being movable towards the reel with the pivotally mounted roller mechanisms being caused to rotate around the longitudinal edge of the reel when one of the rollers comes in contact with the reel thereby causing the extension of each sidewall to be wrapped around and bonded to said reel.

4,227,959

SONIC OR ULTRASONIC APPARATUS FOR SIMULTANEOUSLY CUTTING AND SEAMING SHEET MATERIAL

Abner D. Brown, Elkin, N.C., assignor to Chatham Manufacturing Company, Elkin, N.C.

Filed Dec. 27, 1978, Ser. No. 973,575
Int. Cl.[2] B23K *27/02, 27/08*
U.S. Cl. 156—515 41 Claims



15. An apparatus for providing an elongated seam transversely across sheet material having a heat-fusible component disposed therein by exposing the sheet material to high frequency vibrational energy, said apparatus comprising:

a frame structure for receiving the sheet material and having a station therein in which the seaming is accomplished;

a plurality of electro-acoustical converter units operatively supported on said frame structure and horizontally spaced in juxtaposition to each other in line transversely above the sheet material, each of said electro-acoustical converter units being energized by high frequency electrical energy and converting the same to high frequency vibrational energy, and each having a horn resonant at the high frequency vibrational energy, said horns being closely spaced to each other in line transversely of the sheet material, and each horn having an elongated frontal surface in line with the frontal surfaces of the other horns and for imparting the high frequency vibrational energy to the sheet material when in engagement therewith;

means to move said horns from an initial position vertically downwardly into engagement with the sheet material and then horizontally while in engagement with the sheet material and then vertically upwardly out of engagement with the sheet material and horizontally back to the initial position; and

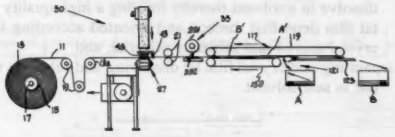
stationary anvil means disposed beneath and extending transversely of the sheet material and opposing the frontal surfaces of said in-line horns, said anvil means including a plurality of closely spaced in-line anvil pins projecting upwardly towards and supporting said sheet material, and each of said anvil pins biased upwardly a predetermined distance.

4,227,960

APPARATUS FOR APPLYING TAPE MATERIAL IN CONTINUOUSLY ADVANCING SHEET MATERIAL

Romain E. Loeffler, Littleton, Colo.; Calvin P. Sorensen, Toledo, Ohio, and Larry J. Weinstein, Littleton, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 846,731, Oct. 31, 1977. This application Feb. 14, 1979, Ser. No. 12,084
Int. Cl.[3] B32B *31/00, 31/04*
U.S. Cl. 156—519 22 Claims



1. Apparatus comprising:

means for supplying a sheet material,

means for continuously advancing said sheet material at a constant speed in a predetermined direction,

means for supplying a double sided pressure sensitive adhesive material having one side uncovered and the other side covered by a removable strip of material,

means for holding said adhesive material in a stationary position with the longitudinal axis of said adhesive material extending in a direction normal to the direction of movement of said sheet material, said one side facing said sheet material,

a transversely extending resilient pad spaced opposite said holding means, said pad being mounted for relatively rapid movements defined by a first movement towards the stationarily held adhesive material to make pressure-transmitting slidable contact with a surface of said sheet material and a second movement away from said adhesive material to disengage from said sheet material surface, and

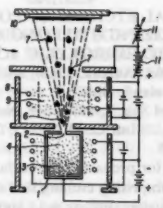
a transversely extending bar mounted to move with said resilient pad such that during said second movement said bar slidably engages a surface of said sheet material to move said sheet material away from said holding means.

4,227,961

PROCESS FOR FORMING A SINGLE-CRYSTAL FILM

Toshinori Takagi, Nagaokakyo, Japan, assignor to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Jun. 14, 1976, Ser. No. 695,646
Claims priority, application Japan, Jun. 27, 1975, 50-79413
Int. Cl.[3] C30B *23/08*
U.S. Cl. 156—608 5 Claims



1. A process for forming a thin single-crystal film comrising the steps of:

heating and vaporizing a film material in a closed type crucible with at least one injection nozzle to form vapor of said material;

injecting said vapor through said injection nozzle into a vacuum region the pressure of which is kept at 1/100 or

less of the vapor pressure in said crucible and at about 10^{-2} Torr or less to adiabatically expand said vapor so as to attain a supercooled state and form clusters comprising atoms of said vapor;

ionizing at least one atom forming said clusters by bombarding said clusters with electrons to produce ionized clusters;

accelerating said ionized clusters by means of an electric field;

permitting said accelerated clusters to collide with a cleavage plane of a substrate material easy to cleave and easy to dissolve in a solvent thereby forming a high-quality crystal film deposited thereon and oriented according to the crystal axis of said substrate material; and

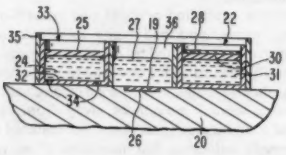
separating said crystal film by dissolving said substrate material in said solvent.

4,227,962

PREVENTION OF DECOMPOSITION OF PHOSPHOROUS CONTAINING SUBSTRATES DURING AN EPITAXIAL GROWTH SEQUENCE

George A. Antypas, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 12, 1979, Ser. No. 19,375
Int. Cl.[3] H01L *21/20*
U.S. Cl. 156—624 5 Claims



1. A technique for preventing the decomposition of a phosphorous-containing substrate during an epitaxial growth sequence which comprises in the vicinity of said substrate providing a phosphorous-containing solution in which phosphorous is a solute in a molten metal solvent, said solvent having a higher solubility for phosphorous than the solubility of phosphorous in the material of said substrate, and said solvent having sufficient phosphorous dissolved therein to produce a phosphorous partial pressure greater than the inherent partial pressure of phosphorous above the material of said substrate.

4,227,963

CHEMICAL ETCHING OF POLYMERS FOR METALLIZING UTILIZING AN AQUEOUS SULFURIC-CARBOXYLIC ACID ETCHANT

Wayne T. Wiggins, Aurora, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Sep. 7, 1978, Ser. No. 940,406
Int. Cl.[2] B29C *17/08*
U.S. Cl. 156—668 8 Claims

1. The method for preparing the surface of a polymer article for metallizing comprising etching said surfaces with a mixture of consisting of water, sulfuric acid and a carboxylic acid.

2. The method of claim 1 wherein the weight ratio of sulfuric acid to carboxylic acid is from 5.5/1 to 1/2.5.

3. The method of claim 2 wherein the polymer is selected from the group consisting of ABS and one prepared by the polymerization of

(A) from 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=C(R)-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen,

(B) from 10 to 40% by weight based on the combined weight of (A) and (B) of at least one member selected from the group consisting of

(1) an ester having the structure

$$CH_2=C(R_1)-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(2) an alpha-olefin having the structure

$$CH_2=C(R')-R''$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

(3) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(4) vinyl acetate,

(5) styrene, and

(6) indene,

in the presence of from 0 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally a comonomer selected from the group consisting of styrene, a nitrile monomer having the structure

$$CH_2=C(R)-CN$$

wherein

R has the foregoing designation, and an ester having the structure

$$CH_2=C(R_1)-COOR_2$$

wherein R_1 and

R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer.

4,227,964

METHOD OF TREATING LIGNOCELLULOSIC OR CELLULOSIC PULP TO PROMOTE THE KINKING OF PULP FIBRES AND/OR TO IMPROVE PAPER TEAR STRENGTH

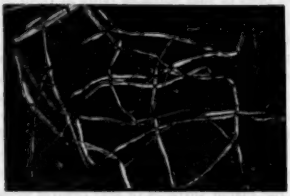
Allan J. Kerr, and Robert P. Kibblewhite, both of Private Bag, Rotorua, New Zealand

Continuation of Ser. No. 855,677, Nov. 29, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,768

Claims priority, application New Zealand, Dec. 1, 1976, 182782; Jun. 7, 1977, 184312

Int. Cl.[2] D21C 9/00

U.S. Cl. 162—9 21 Claims



1. A method of kinking pulp fibers in order to increase the tear strength of papers made from such fibers, wherein the pulp is a lignocellulosic or cellulosic pulp derived from a chemical, semichemical or chemimechanical pulping process, said method comprising kinking pulp fibers having a consistency of approximately 15 up to approximately 400 weight percent of dried pulp in the total material, water plus pulp, while substantially maintaining pulp yield by treating the pulp with gaseous ammonia at a pressure of at least one atmosphere until at least 9% by weight, based on the weight of oven dried pulp, of gaseous ammonia has been taken up by the moist pulp.

4,227,965

PRODUCTION OF HARDBOARD

Myron M. Luszczak, Palatine, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Jul. 2, 1979, Ser. No. 54,206

Int. Cl.[2] D21B 1/04

U.S. Cl. 162—13 9 Claims

1. An improved process for manufacturing wood fiber board characterized by eliminating the conventional baking step that follows pressing of the mat to board and by imparting additional strengths and water resistance to the formed board which comprises:

(1) reducing a supply of wood to chips;

(2) blending a small amount of drying oil with said chips, said drying oil ranging from about 0.5% to about 10% by dry weight of the wood chips;

(3) steaming the treated wood chips in a closed vessel for a period of time from about 1 to 10 minutes and at a pressure between about 50 and 300 lbs. per square inch, whereby the drying oil is sorbed into the wood chips;

(4) refining the wood chips whereby the treated chips are formed into fibers;

(5) forming the fibers into an aqueous slurry pulp;

(6) mechanically dewatering the pulp to obtain a wet mat;

(7) drying the wet mat by thermal evaporization;

(8) and pressing the dried mat between heated forming surfaces to form a hardboard.

4,227,966

METHOD FOR COMBUSTING A MIXTURE OF SPENT MAGNESIUM SULPHITE DIGESTION LIQUOR AND ALKALINE OXYGEN BLEACH LIQUOR

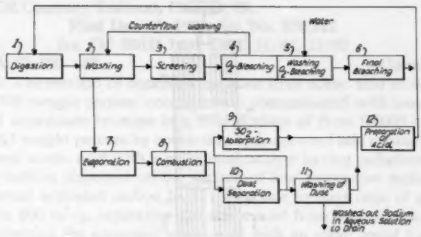
Lennart Ivnas, Sundsvall, and Karl-Erik Lekander, Alingsas, both of Sweden, assignors to Sunds Aktiebolag, Sweden

Filed Mar. 6, 1979, Ser. No. 17,967

Claims priority, application Sweden, Mar. 10, 1978, 7802789

Int. Cl.[2] D21C 11/02, 11/04, 11/12

U.S. Cl. 162—36 8 Claims



1. A method for combining and recovering spent magnesium sulfite digestion liquor and alkaline oxygen bleaching liquor, without forming a smelt of sodium compounds during combustion of the combined spent liquors, comprising:

(a) digesting pulp in a magnesium sulfite-containing cooking acid liquor;

(b) washing the digested pulp with a washing liquid so as to remove at least 97% of spent cooking acid liquor from the digested pulp, said spent cooking acid liquor containing magnesium;

(c) oxygen bleaching said digested pulp in the presence of oxygen and from about 5 to about 40 kilograms of sodium hydroxide per ton of dry unbleached pulp, thereby obtaining a sodium-containing spent liquor;

(d) using said sodium-containing spent liquor as said washing liquid, thereby obtaining a mixed liquor of said magnesium-containing spent liquor and said sodium-containing liquor wherein said mixed liquor has a ratio of magnesium to sodium compounds measured as a molar ratio of magnesium oxide to sodium hydroxide of at least 1;

(e) combusting said mixed liquor to produce a mangesium oxide-containing dust;

(f) removing a sufficient amount of the sodium compounds from said magnesium oxide containing dust to prevent a build-up of sodium in said cooking acid liquor such that a smelt of sodium compounds is not formed during said combusting step; and

(g) using said dust in the preparation of the magnesium sulfite-containing cooking acid liquor.

4,227,967

METHOD AND APPARATUS FOR REDUCING THE POWER LEVEL IN A NUCLEAR REACTOR DURING TEMPERATURE TRANSIENT

Edwin L. Zebroski, Los Altos, Calif., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 3, 1977, Ser. No. 803,138

Int. Cl.[2] G21C 7/00

U.S. Cl. 176—36 R 5 Claims

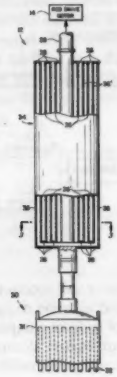
1. Apparatus for controlling the power level in a nuclear reactor, said reactor having a core that is cooled during normal operation by a flow of primary coolant, comprising:

(a) an elongate absorber support shaft adapted for relative motion with respect to the core of a nuclear reactor;

(b) an elongate absorber member for absorbing neutrons in the nuclear reactor, said member being adapted for relative motion with respect to the core of the reactor; and

(c) a plurality of high coefficient thermal expansion members

and a corresponding plurality of low coefficient thermal expansion members disposed in alternate relationship and connected in series alternately at their top ends and at their bottom ends, said expansion members being elongate and attached at one end of the alternating series to the absorber support shaft and at the other end of the series to the absorber member so that the absorber support shaft, absorber member, and thermal expansion members all have longitudinal axes oriented in a direction generally parallel to the direction of relative motion between the



absorber member and the core and together form an elongate in-line structure, the absorber member being moved relative to the core by the motion of the absorber support shaft and by thermal elongation of the expansion members, the absorber member being movable by thermal elongation relative to the absorber support shaft into closer proximity with the core as the temperature of the core increases, said thermal expansion members being in thermal communication with the core and responsive to the temperature thereof.

4,227,968

PRESSURE VESSEL ASSEMBLY FOR HIGH-TEMPERATURE NUCLEAR REACTOR

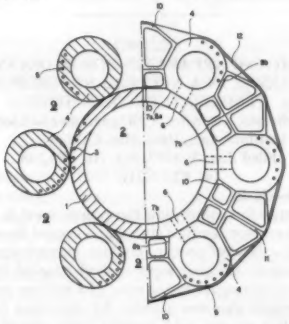
Erik Bodmann, Mannheim, Fed. Rep. of Germany, assignor to Siempelkamp Giesserei GmbH, Krefeld, Fed. Rep. of Germany

Filed Jan. 5, 1979, Ser. No. 1,391

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1978, 2800644

Int. Cl.[2] G21C *5/00*

U.S. Cl. 176—87 **8 Claims**



1. In a pressure-vessel assembly for a nuclear-reactor installation wherein a central pressure vessel of cast material and of generally cylindrical configuration is adapted to receive a high-temperature nuclear reactor, and a plurality of component vessels of cast material surround the central vessel and communicate by respective gas passages therewith, the component vessels receiving heat exchangers for at least a primary coolant for the nuclear reactor, the improvement wherein:

the central vessel communicates with each of the component vessels via a respective one of said passages with the passages lying in a common horizontal plane and extending radially of the central vessel;

said central vessel is provided with a multiplicity of generally vertical planar surfaces in said horizontal plane, respective ones of said surfaces lying at right angles to the respective passages;

said component vessels are provided with planar surfaces in the region of said passages with one planar surface lying flat against a corresponding surface of said central vessel perpendicular to the passage communicating between the respective component vessel and the central vessel;

respective support blocks of a height substantially equal to that of said planar surfaces are received between pairs of said component vessels and have planar surfaces lying against the planar surfaces of said central vessel between said component vessels and of said component vessels; and

at least one inward prestressing member extends peripherally around the assembly and bears inwardly upon said support blocks and said component vessels, said support blocks, said central vessel and said component vessels forming a compound-disk structure in the region in which said component vessels and support blocks are engaged by said member.

4,227,969

OIL RECLAMATION DEVICE

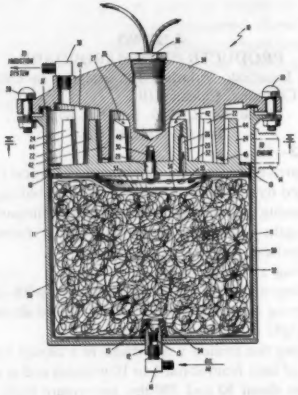
Gary C. Engel, 123 N.W. 109th St., Miami Shores, Fla. 33168

Continuation of Ser. No. 852,976, Nov. 18, 1977, Pat. No. 4,189,351. This application Jan. 31, 1979, Ser. No. 8,127

The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.

Int. Cl.[3] B01D *3/28, 35/18;* C10G *7/00*

U.S. Cl. 196—115 **22 Claims**



1. An oil reclamation device having a longitudinal axis and comprising:

(a) a housing means, filter means, evaporator plate means and heating means,

(b) said evaporator plate means including upwardly projecting evaporation wall means defining a fluid traveling surface and an upwardly disposed vaporizing surface

facing inwardly toward the center of the evaporator plate means,

(c) said heating means including downwardly projecting centerpost means defining a heating surface located adjacent and facing outwardly toward the inwardly facing vaporizing surface,

(d) said evaporation wall means defining a curved path along the fluid traveling surface outwardly from said longitudinal axis along said evaporator plate means,

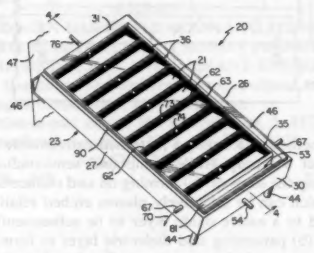
(e) said evaporator plate means including passageway means extending from the filter means to deliver substantially all of the oil being treated inwardly along the inwardly facing vaporizing surface toward the longitudinal axis and toward the centerpost means,

(f) said fluid traveling surface having a structural configuration effective to guide the oil from said centerpost means outwardly along said curved paths to an oil outlet means in the housing.

4,227,970
SOLAR DISTILLATION APPARATUS

Alexander G. Howell, Jr., and Evan E. Settle, III, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Apr. 4, 1977, Ser. No. 784,586
Int. Cl.³ B01D *1/00*
U.S. Cl. 202—234 **21 Claims**



1. A solar distillation apparatus for use in ambient air comprising, a box-like structure defined by a bottom wall having a reflective surface for reflecting radiant energy and a plurality of adjoining substantially rigid peripherally walls, said peripheral walls being comprised of a pair of opposed side walls and a pair of opposed end walls, each of said side walls and said end walls having portions made of U-shaped sections of similar cross-sectional configurations and inner housing portions made of L-shaped sections of similar cross-sectional configurations, each of said L-shaped sections having a leg defining a top surface, each of said outer housing portions being disposed with respect to one of said inner housing portions so as to define a high strength housing which characterizes one of said peripheral walls, there being a thermally insulating material contained within each such high strength housing; removable pan means mounted in spaced relation above said reflective surface and defining an ambient air space between said pan means and said reflective surface; a flat transparent cover having a bottom surface disposed parallel to said reflective surface and supported by said top surfaces; said structure being adapted to be supported at an inclined angle to a horizontal plane so that said cover is disposed at a corresponding inclined angle; said pan means being adapted to contain a distilland therein which has its upper portion heated by solar radiant energy passing through said cover and simultaneously has its lower portion at least partially heated by radiant energy reflected from said reflective surface with the simultaneous heating resulting in more efficient heating of said distilland and the provision of vapors from said distilland which engage said bottom surface of said cover and condense thereon due to cooling action produced by said ambient air to define a distillate which is adapted to move under the influence of gravity along said bottom surface; and a reservoir for collecting said distillate; said reflective surface cooperating with said air space thereabove to assure minimum conductive heat loss from said bottom wall.

4,227,971
BROMINE REMOVAL FROM ACETIC ACID

Wilford J. Zimmerschied, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 18, 1978, Ser. No. 970,222
Int. Cl.² B01D *3/00*; C07C *51/44, 53/08*
U.S. Cl. 203—32 **4 Claims**

1. The method of removing bromine from acetic acid of 95 to 100 weight percent concentration contaminated with ionic and coordinate bromine in a total amount of from 0.0005 to 0.015 weight percent by contacting hydrogen and said contaminated acetic acid with a palladium catalyst having palladium crystallites dispersed on the surface of low extraneous metal content activated carbon having a surface to mass ratio of at least 800 m^2/g, separating the acetic acid from said catalyst, contacting the separated acetic acid with an alkali metal hydroxide, carbonate or bicarbonate, and distilling the acetic acid from said alkali metal compound.

4,227,972
PROCESS FOR RECOVERING PHOSPHATE ESTER TYPE HYDRAULIC FLUIDS FROM INDUSTRIAL WASTE LIQUIDS

Pablo M. Hernandez, Waukegan, and William J. Luplow, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 1, 1978, Ser. No. 901,473
Int. Cl.² B01D *1/22, 3/28*; C10M *1/44*
U.S. Cl. 203—37 **11 Claims**

1. A process for recovering a phosphate ester type hydraulic fluid from a waste liquid containing water, organic solvents and other impurities, which process comprises the steps of

distilling the waste liquid at a temperature of about 190° to about 260° C. and at a pressure of about 2 to about 30 mm Hg,

removing water, low boiling organic solvents, and other low boiling impurities as an overhead from the distillation step,

removing the hydraulic fluid and high boiling impurities as liquid bottoms from the distillation step,

evaporating the bottoms from the distillation step at a temperature of about 260° to about 380° C. and a pressure up to about 5 mm Hg,

removing high boiling impurities as bottoms from the evaporation step,

removing the hydraulic fluid as an overhead from the evaporation step, and

condensing the overhead from the evaporation step to recover the hydraulic fluid.

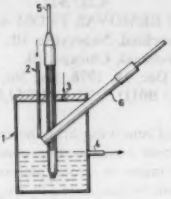
4,227,973
AUTOMATIC ANALYSIS OF ALKALI METALS HALIDES ETC. BY MEANS OF THE USE OF ION-SELECTIVE ELECTRODES

Jaromir Ruzicka, Naerum, and Elo H. Hansen, Lyngby, both of Denmark, assignors to Bifok AB, Sollentuna, Sweden

Filed Sep. 12, 1977, Ser. No. 832,742
Claims priority, application Sweden, Sep. 15, 1976, 7610221
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **4 Claims**

1. A method for determining ions in a continuously flowing liquid stream consisting essentially of a liquid sample solution in a liquid carrier comprising providing a measuring cell and an ion-selective electrode, said ion-selective electrode having a sensitive surface located in the measuring cell, freely and continuously flowing the liquid stream downwardly over the

sensitive surface of the ion-selective electrode in a form of a thin, continuous sheet wherein one side of the liquid sheet is in contact with the sensitive surface of the ion-selective electrode as the sheet flows across the sensitive surface while the other side of the liquid sheet is exposed to the atmosphere of the measuring cell, the pressure of which is the same as the atmospheric pressure outside the cell, immediately thereafter permitting the liquid stream to flow as the same continuous sheet without interruption into a reservoir in the measuring cell consisting essentially of the liquid carrier and in which a reference electrode is placed, said ion-selective electrode being located above the liquid level in the reservoir, so that the potential difference between the electrodes in the measuring cell can be continuously determined.



4,227,974

ELECTROCHEMICAL CELL HAVING A POLAROGRAPHIC DEVICE WITH ION SELECTIVE ELECTRODE AS WORKING ELECTRODE AND METHOD OF USE

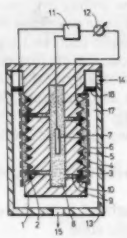
Otto Petersen, and Hans-Dieter Schmidt, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 946,680, Sep. 28, 1978, abandoned, which is a continuation of Ser. No. 804,699, Jun. 8, 1977, abandoned. This application Feb. 12, 1979, Ser. No. 11,343

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627271

Int. Cl.[2] **G01N** *27/46*

U.S. Cl. 204—1 T **10 Claims**



1. An electrochemical cell for the detection of a gas in a gas mixture, comprising a working electrode consisting of an ion-selective electrode, a reference electrode, an auxiliary electrode, an electrolyte, a potentiostat which is adjustable to the characteristic voltage for the component to be measured for monitoring the potential at zero current of the working electrode with respect to the reference electrode and for effecting a current flow between the auxiliary and working electrodes for polarizing the working electrode anodically or cathodically, a current measuring instrument for measuring the current between the working and auxiliary electrodes which is proportional to the concentration of the component and means for conducting the gas to the boundary between the working electrode and the electrolyte.

10. A method for the detection of a gas in a gas mixture which comprises providing an ion-selective electrode, an auxiliary electrode, a reference electrode and an electrolyte between the electrodes; adjusting a potentiostat to the characteristic voltage for the component to be measured and connecting same to the electrodes for monitoring the potential at zero current of the working electrode with respect to the reference electrode and for effecting a current flow between the auxiliary and working electrodes to polarize the working electrode anodically or cathodically; conducting the gas to the boundary between the working electrode and the electrolyte; and measuring the current between the working and auxiliary electrodes which is proportional to the concentration of the component.

4,227,975

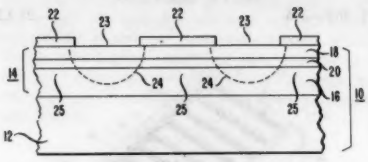
SELECTIVE PLASMA ETCHING OF DIELECTRIC MASKS IN THE PRESENCE OF NATIVE OXIDES OF GROUP III-V COMPOUND SEMICONDUCTORS

Robert L. Hartman, Warren Township, Somerset County; Louis A. Koszi, Scotch Plains; Cyril J. Mogab, Berkeley Heights, and Bertram Schwartz, Westfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 29, 1979, Ser. No. 7,422

Int. Cl.[3] **H01L** *21/283, 21/308, 21/326*

U.S. Cl. 204—15 **14 Claims**



6. A method of forming a patterned native oxide layer on a surface of a Group III–V compound semiconductor body comprising the steps of: (a) forming on said surface a dielectric layer which can be selectively plasma etched relative to said body and to a native oxide layer to be subsequently formed thereon; (b) patterning said dielectric layer to form windows which expose underlying portions of said surface; (c) forming a native oxide layer on said exposed portions; and (d) subjecting said body and both of said layers simultaneously to plasma etching in an atmosphere effective to remove said dielectric layer without attacking said native oxide or said body.

7. The method of claim **6** wherein said dielectric layer is selected from the group consisting of SiO_2, Si_3N_4 and photoresist.

11. The method of claims **6** or **7** including between steps (b) and (c) the additional step of forming grooves in said windows in said exposed underlying portions, thereby forming mesas in said body between said grooves, and wherein step (c) includes forming said native oxide layer in said grooves.

13. The method of claim **11** including after step (d) the additional step of selectively forming metal layers on the tops of said mesas but not on said native oxide layers.

4,227,976

MAGNESIUM ANODIZE BATH CONTROL

Joseph T. Menke, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 30, 1979, Ser. No. 25,632

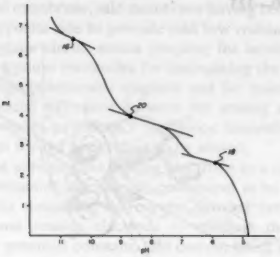
Int. Cl.[3] **G01N** *27/42, 31/16;* **C25D** *11/30*

U.S. Cl. 204—56 M **1 Claim**

1. A method of controlling the concentration of ingredients in a magnesium anodize bath of ammonium bifluoride, sodium dichromate and phosphoric acid including the steps of:

a. titrating dichromate, bifluoride and acid combinations to identify various end points on the titration curve and to observe the pH neutralization curve characteristics,

b. titrating a bath sample with sodium hydroxide to determine the neutralization end point of the bath and the amount of ammonium bifluoride therein,
c. observing from the titration curve derived from step b the combined amount of sodium dichromate and phosphoric acid in the bath sample,



d. titrating another bath sample with thiosulfate to determine the amount of sodium dichromate in the bath and hence the amount of phosphoric acid, and
e. thereafter adding desired additional amounts of each ingredient to make them of desired strength in said bath.

4,227,977

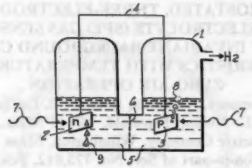
HYDROGEN GAS GENERATION UTILIZING A BROMIDE ELECTROLYTE, A BORON PHOSPHIDE SEMICONDUCTOR AND RADIANT ENERGY

Daniel H. Grantham, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 956,760, Nov. 1, 1978. This application Aug. 13, 1979, Ser. No. 65,824

Int. Cl.[3] **C25B** *1/02*

U.S. Cl. 204—129 **13 Claims**



1. A process for producing hydrogen gas from an electrolyte solution in an electrolyte cell, wherein the improvement comprises utilizing a solution of a bromide compound as the electrolyte in conjunction with radiant energy, and an n-type semiconducting boron phosphide electrode to at least partially power the electrolytic cell.

4,227,978

PHOTOHARDENABLE COMPOSITION

Robert W. Barton, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jun. 27, 1979, Ser. No. 52,418

Int. Cl.[2] **C08F** *2/50, 2/54, 4/00*

U.S. Cl. 204—159.12 **17 Claims**

1. A photohardenable composition comprising:
(a) about 10 to 80 weight percent of a halogenated oligomeric ester having a molecular weight of less than about 10,000 and a content of halogen attached to carbon of an sp^2 electronic configuration of about 19 to 55 weight percent;
(b) about 10 to 80 weight percent of an acrylate or methacrylate monomer compatible with (a);
(c) about 0.2 to 10 weight percent of a free radical generating initiator activatible by actinic light or electron beam irradiation;
(d) about 2 to 20 weight percent of a compound having an average epoxide functionality of about 1 to 1.8;
(e) about 1 to 10 weight percent of a cationic initiator activatible by actinic light or electron beam irradiation.

4,227,979

RADIATION-CURABLE COATING COMPOSITIONS CONTAINING AMIDE ACRYLATE COMPOUNDS

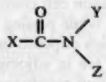
Byron M. Humke, Glenshaw; Gerald W. Gruber, Sewickley; Rostyslaw Dowbenko, Gibsonia, and Charles B. Friedlander, Glenshaw, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 5, 1977, Ser. No. 839,686

Int. Cl.[2] **C08F** *2/50, 20/36;* **C08L** *33/14*

U.S. Cl. 204—159.16 **30 Claims**

1. Radiation polymerizable, highly radiation-sensitive composition curable to form a film comprising from about one to 99 percent by weight of one or more amide acrylate compounds having one nitrogen atom and being of the formula:



wherein X, Y and Z may each independently be H, alkyl, aryl, acrylyloxyalkyl, acrylyloxy aliphatic ester formed by reaction of acrylating material with hydroxyl terminated aliphatic ester-containing intermediate resulting from the reaction of inner ester of hydroxy carboxylic acid and amino alcohol, or acrylyloxy aliphatic ether, provided that X, Y and Z together have two, three of four acrylyloxy groups.

4,227,980

PHOTOREACTIVE COATING COMPOSITIONS BASED ON URETHANE MODIFIED ACRYLATES

Siegfried A. Pregitzer, Long Island; Jay K. Laufer, Huntington; John J. Marino, Kings Park, all of N.Y., and James W. Hancock, Scotch Plains, N.J., assignors to Whittaker Corporation, Los Angeles, Calif.

Continuation of Ser. No. 726,010, Sep. 22, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 941,760

Int. Cl.[2] **C08F** *2/50, 4/00*

U.S. Cl. 204—159.23 **3 Claims**

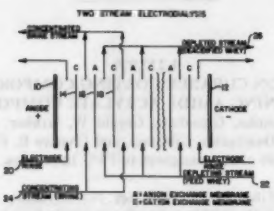
1. A radiation curable decorating ink comprising:
a substantial proportion of at least one photoreactive compound of the formula:

wherein
R is cyclohexyl or C_{6-8} aryl,
R′ is C_{2-4} alkylene, and
R″ is H or CH_3;
2% to 20% of at least one photoinitiator based upon the weight of said photoreactive compound;
at least one free radical inhibitor; and
20% to 60% of at least one pigment based upon the total weight of said ink.

4,227,981
ELECTRODIALYSIS OF ACID WHEY

Alexander W. Williams, Syracuse, N.Y., and Harry A. Kline, Wonder Lake, Ill., assignors to Borden, Inc., Columbus, Ohio

Filed Aug. 31, 1979, Ser. No. 71,698
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—180 P 14 Claims



1. Process for reducing ash content and titratable acidity in liquid whey, without forming a substantial precipitate, comprising treating at least a portion of the whey in a demineralization cell and treating at least a portion of the whey in a deacidification cell under the influence of electrical current, the treatment in the demineralization cell comprises passing the whey through a first chamber while passing brine solution through second and third chambers disposed on both sides of the first chamber, the chambers are in adjoining disposition and are defined by anion and cation membranes arranged in an alternating sequence; the treatment in the deacidification cell comprises passing a brine solution through a first chamber, passing the whey through a second chamber, and passing caustic solution through a third chamber, the chambers of the cell are in adjoining disposition and are defined by spaced membranes disposed in the sequence of cation-anion-anion-cation wherein the whey chamber is defined by the pair of anion membranes.

4,227,982
ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF COPOLYMERS OF POLYETHYLENICALLY UNSATURATED EPOXY-AMINE ADDUCTS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 860,908, Dec. 15, 1977, Pat. No. 4,172,062.
This application May 31, 1979, Ser. No. 44,270
Int. Cl.[2] C25D *13/06*
U.S. Cl. 204—181 C 7 Claims

1. A method of electrodepositing a physically tough, corrosion resistant coating on the cathode of a unidirectional electrical system from an aqueous bath having a pH of 5.0–7.5 comprising passing a unidirectional electrical current through an aqueous bath comprising a water dispersible polymer which is a copolymer of:

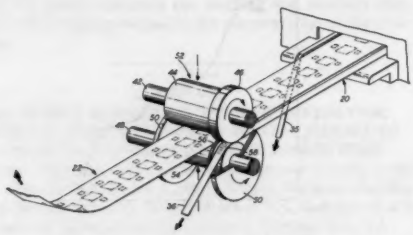
(A) an ethylenically unsaturated hydroxy functional amine adduct free of epoxy groups and containing from about 1.4 to about 2.0 ethylenically unsaturated amine groups per molecule, formed from a polyepoxide having a 1,2-epoxy equivalency of from about 1.4 to about 2.0 and at least a stoichiometric amount of an ethylenically unsaturated secondary amine having two ethylenically unsaturated groups; and

(B) copolymerizable monoethylenically unsaturated monomers, a portion of which is amine-functional, said copolymer being dispersed in water with the aid of a solubilizing acid, said bath including an aminoplast or phenol-formaldehyde curing agent, and said electrical current depositing a coating of said polymer and said curing agent on the cathode, removing the coated cathode from the bath, and baking the same.

4,227,983
METHOD FOR MAKING CARRIER TAPE

Michael T. Gursky, and William W. Peihoda, both of Lehigh County, Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,621
Int. Cl.[2] H05K *1/04, 3/00*
U.S. Cl. 430—323 19 Claims



1. A method of making carrier tape from metal foil having no substantial resistance to bending, comprising:

successively gripping along a substantially unperforated drive portion of a strip of metal foil in a continuous manner, such drive portion extending substantially along the full length of the strip, and driving the strip thereby in a lengthwise direction;

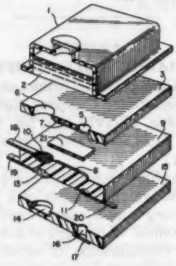
forming a pattern in at least one portion of the strip in such a manner that no support materials are affixed to the strip, the pattern portion being disposed separately from the drive portion of the strip; and

separating the pattern portion of the strip from the drive portion of the strip whereby said pattern portion becomes usable for carrier tape.

4,227,984
POTENTIOSTATED, THREE-ELECTRODE, SOLID POLYMER ELECTROLYTE (SPE) GAS SENSOR HAVING HIGHLY INVARIANT BACKGROUND CURRENT CHARACTERISTICS WITH TEMPERATURE DURING ZERO-AIR OPERATION

Russell M. Dempsey, Hamilton; Anthony B. LaConti, Lynnfield, and Mary E. Nolan, Topsfield, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Continuation-in-part of Ser. No. 773,012, Feb. 28, 1977, abandoned. This application Mar. 1, 1979, Ser. No. 16,364
The portion of the term of this patent subsequent to Oct. 16, 1996, has been disclaimed.
Int. Cl.[3] G01N *27/46*
U.S. Cl. 204—195 S 9 Claims



1. In a temperature invariant electrochemical, gas-sensing device the combination comprising:

(a) an ion transporting membrane;

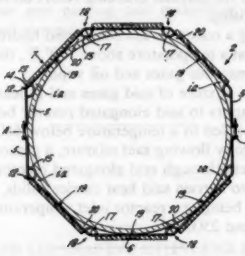
(b) catalytic sensing and counter electrodes positioned on opposite sides of said membrane;
(c) a catalytic reference electrode positioned on the same side of the membrane as said sensing electrode;
(d) an ionically conductive, low-resistance path between said counter electrode and an area which is spatially aligned with the reference electrode but on the opposite side of said membrane, said membrane having been treated on said opposite side to provide said low resistance path;
(e) potentiostatic circuit means coupling the sensing, reference and counter electrodes for maintaining the potential at the sensing electrodes constant and for maintaining a fixed potential difference between the sensing and reference electrodes to maintain the device insensitive to the carrier gas for the constituent to be sensed;
(f) means for exposing the sensing electrode to a carrier gas stream containing the gaseous constituent to be sensed;
(g) means for measuring the current flowing between the counter and sensing electrode to maintain the sensing electrode potential constant, said current being a measure of a concentration of the selected gaseous constituents.
(h) means to maintain background current substantially constant with varying temperatures including means maintaining the resistance between the reference and sensing electrodes greater than 60 ohms means and maintaining the ratio of sensing to reference and sensing to counter electrode resistances in excess of 50 whereby the background current changes with temperature in the absence of the gaseous constituent to be sensed are minimized.

4,227,985

ANODE ASSEMBLY

John H. Morgan, Winchester, England, assignor to Morgan Berkeley & Company Ltd., Winchester, England

Filed Feb. 22, 1979, Ser. No. 14,328
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—196 **7 Claims**



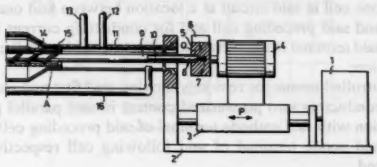
1. An anode assembly for use in a system for the cathodic protection of a submerged, or partly submerged elongate metallic member, the assembly comprising two or more parts adapted to be fixed together to encircle a length of the elongate member, each part having a plurality of interconnected, generally flat, elongate electrically insulating panels of which at least one accommodates a metallic element, means for providing electrical connection to said metallic elements, the arrangement being such that, in use of the assembly, with said parts fixed together as aforesaid, the panels are circumferentially disposed around the elongate member with a part of the surface of each metallic element exposed outwardly of the elongate member, and with a space formed between the assembly and said elongate member, the assembly being apertured to permit electrical current to flow through said space to the elongate member from said metallic elements operating as anodes in the said system.

4,227,986

APPARATUS FOR PROVIDING A SURFACE COATING ON THE WALL IN A CAVITY BY MEANS OF ELECTROLYTIC PLATING

Kaj-Ragnar Loqvist, Fagersta, and Leif-Ake Bennstedt, Falun, both of Sweden, assignors to Wave Energy Development I Vastmanland Aktiebolag, Fagersta, Sweden

Division of Ser. No. 873,524, Jan. 30, 1978. This application Jun. 21, 1978, Ser. No. 917,485
Claims priority, application Sweden, Feb. 8, 1977, 7701371
Int. Cl.[2] C25D *17/12, 17/10*
U.S. Cl. 204—209 **6 Claims**



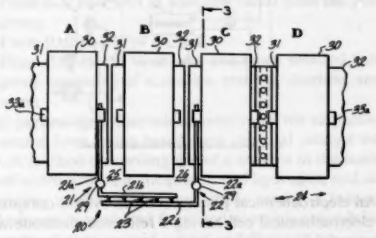
1. An apparatus for providing a surface coating of a metal or metal alloy on the wall of an elongate cavity workpiece by means of electrolytic plating, the workpiece being used as a cathode, characterized by at least one anode for placement longitudinally extending in the cavity of a workpiece, and at least one conveyor, comprising a resilient and electrically insulating material for transporting the electrolyte and gas produced during said plating, said material comprising at least one flexible, homogeneous, perforated, net-like or fibrous strip helically wound around the anode in its longitudinal direction, said helically wound strip having outstanding resilient fingers in contact with the wall of said cavity while the strip lies against the anode and being enabled to come into contact with every part of said surface while adjusting to the surface to be coated.

4,227,987

MEANS FOR CONNECTING AND DISCONNECTING CELLS FROM CIRCUIT

Morton S. Kircher, Clearwater, Fla., and Steven J. Specht, Mentor, Ohio, assignors to Olin Corporation, New Haven, Conn.

Filed Nov. 26, 1979, Ser. No. 97,115
Int. Cl.[3] C25B *15/00, 9/04*
U.S. Cl. 204—228 **20 Claims**



1. A jumper system for electrically bypassing one cell of a plurality of chloralkali diaphragm cells connected in an electrical series circuit without interrupting the electrical flow through the other cells in said circuit, where each of said cells has vertical anodes and cathodes oriented parallel to the overall direction of current flow in said circuit, cathode and anode terminals lying transversely between said cells and oriented parallel widthwise to said overall direction, and anode current

distributor connecting said anodes to said anode terminal and a cathode current collector connecting said cathodes to said cathode terminal, said jumper system comprising:

first transverse conductor means, for assuming a position extending parallel to said cathode terminal and contacting in such position the lengthwise center of the cathode terminal of the cell preceding said one cell in said circuit at a location between said one cell and said preceding cell and for conducting current from said terminal in a direction transverse to said overall direction;

second transverse conductor means for assuming a position extending parallel to said anode terminal and contacting in such a position an anode terminal of the cell following said one cell in said circuit at a location between said one cell and said preceding cell and for conducting current from said terminal in a direction transverse to said overall direction;

controlled means for remotely moving said first and second conductors into pressurized contact in said parallel position with said cathode terminal of said preceding cell and said anode terminal of said following cell respectively; and

switch means, adapted to be positioned adjacent said one cell, for selectively allowing and preventing electrical current flow from said first transverse conductor means to said second transverse conductor means whereby current bypasses said one cell.

4,227,988

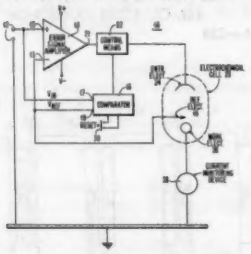
POTENTIOSTAT FOR USE WITH ELECTROCHEMICAL CELLS

Ronald K. Galwey, Los Gatos, and Kay K. Kanazawa, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,415

Int. Cl.[3] **C25B** *15/02;* **G01N** *27/30;* **G05F** *1/10;* **H02H** *9/00*

U.S. Cl. 204—231 **9 Claims**



7. An electrochemical potentiostat-cell system comprising

an electrochemical cell having a reference electrode with a potential V_R,

a potentiostat associated with said cell and having an input voltage V_{IN},

control means electrically connected to said cell, and

a comparator for comparing the difference between V_R and V_{IN} associated with said control means wherein when the magnitude of the difference between the values of V_{IN} and V_R exceeds a preselected value, said control means causes the current in said cell to go to zero.

4,227,989

LIQUEFACTION OF CALCIUM-CONTAINING SUBBITUMINOUS COALS AND COALS OF LOWER RANK

Martin L. Gorbaty, Sanwood, N.J., and John W. Taunton, Seabrook, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 19, 1977, Ser. No. 798,663

Int. Cl.[2] **C10G** *1/00, 1/06;* **C10L** *0/00*

U.S. Cl. 208—8 LE **15 Claims**

1. A process for the treatment of calcium-containing subbituminous coals and coals of lower rank to form an insoluble, thermally stable calcium salt which does not form a scale during coal liquefaction consisting essentially of

dispersing and forming a solution of an alkali metal compound or salt characterized by the formula MX, wherein M is a Group IA metal of the Periodic Table of the Elements, and X is an anion which is capable of forming a water insoluble, thermally stable calcium compound,

contacting said coal and said solution,

maintaining contact between said coal and said solution of said alkali metal compound or salt for a period sufficient for impregnation of said compound or salt into the pores of the coal such that alkali metal cations replace at least a portion of the Ca^{2+} ion and the anion, X, combines with the Ca^{2+} ion thus replaced to form a molecular species which precipitates within the pore as insoluble CaX,

separating said impregnated particulate coal from said solution, and then

liquefying said impregnated coal at liquefaction conditions to produce petroleum-like liquid products.

4,227,990

THERMAL CRACKING OF RETORT OIL

James D. Dearth, Dallas, and Robert H. Smith, Plano, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 20, 1978, Ser. No. 962,510

Int. Cl.[3] **C01G** *1/00*

U.S. Cl. 208—8 R **5 Claims**

1. A process for thermal cracking retort oil in an elongated reactor comprising:

(a) operating a retort for normally solid hydrocarbonaceous materials at a temperature above 700° F., thereby producing carbonaceous gases and oil vapors;

(b) passing a mixture of said gases and at least a portion of said oil vapors to said elongated reactor before said mixture has cooled to a temperature below 680° F.; and

(c) concurrently flowing said mixture, a gaseous diluent and heat carriers through said elongated reactor at a velocity sufficient to entrain said heat carrier solids, said heat carrier solids being at a reactor inlet temperature of between 1200° F. and 2500° F.

4,227,991

COAL LIQUEFACTION PROCESS WITH A PLURALITY OF FEED COALS

Norman L. Carr, Allison Park, Pa., and Bruce K. Schmid, Denver, Colo., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

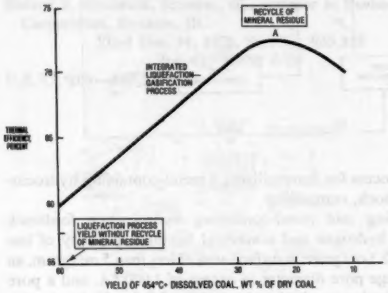
Filed Dec. 15, 1978, Ser. No. 969,823

Int. Cl.[2] **C10G** *1/00, 1/08*

U.S. Cl. 208—8 LE **7 Claims**

1. A coal liquefaction process comprising admixing in a feed coal mixing vessel a total coal feed comprising at least two feed coals, recycle normally solid dissolved coal containing liquid solvent, and recycle mineral residue derived from said feed coals; one of said feed coals comprising at least 5 weight percent of the total coal feed and generating upon dissolution particles of mineral residue having a smaller median diameter than the particles of mineral residue generated by the remaining feed coal; passing said feed coals, hydrogen, recycle normally solid dissolved coal, recycle liquid solvent and recycle

mineral residue to a coal liquefaction zone which does not contain a fixed bed of added catalyst to dissolve hydrocarbonaceous material from mineral residue and to hydrocrack said hydrocarbonaceous material to produce a mixture comprising hydrocarbon gases, dissolved liquid, normally solid dissolved coal and suspended mineral residue; passing a liquefaction zone effluent stream through vapor-liqud separator means to remove overhead hydrogen, hydrocarbon gases and naphtha from a residue slurry comprising liquid coal and normally solid dissolved coal with suspended mineral residue; recycling a first portion of said residue slurry to said feed coal mixing vessel; passing a second portion of said residue slurry to a product


RECYCLE OF MINERAL RESIDUE
A
INTEGRATED LIQUEFACTION-GASIFICATION PROCESS
LIQUEFACTION PROCESS YIELD WITHOUT RECYCLE OF MINERAL RESIDUE
YIELD OF 454°C+ DISSOLVED COAL, WT % OF DRY COAL

separation means; passing a third portion of said residue slurry through hydroclone means; recovering from said hydroclone means an overflow slurry comprising liquid coal and normally solid dissolved coal with relatively small particles of suspended mineral residue; recycling said overflow slurry to said liquefaction zone to selectively increase the proportion in the liquefaction zone of the mineral residue particles generated from said one feed coal; recovering from said hydroclone means an underflow slurry comprising liquid coal and normally solid dissolved coal with relatively large particles of suspended mineral residue; and passing said underflow slurry to said product separation means.

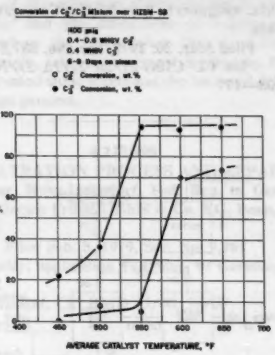
4,227,992

PROCESS FOR SEPARATING ETHYLENE FROM LIGHT OLEFIN MIXTURES WHILE PRODUCING BOTH GASOLINE AND FUEL OIL

William E. Garwood, Haddonfield, and Wooyoung Lee, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 24, 1979, Ser. No. 41,843
Int. Cl.³ C10G *35/06*
U.S. Cl. 208—46 **8 Claims**

1. In the process of contacting mixtures of C_2–C_5 olefins with an acidic crystalline aluminosilicate zeolite having a pore diameter greater than about 5 Angstroms, a silica-to-alumina ratio of at least 12, and a constraint index within the range of 1–12 at elevated temperatures, the improvement which comprises (a) carrying out said contact at a temperature of from about 300°–600° F., a pressure of from about 100–1,000 psig and at a space velocity with regard to C_3 and higher olefins ranging from about 0.1 to 10 WHSV; (b) said temperature, space velocity and pressure being chosen so as to convert at least 80% of the C_3 and higher olefins and no more than about 20 weight percent of said ethylene; (c) obtaining a product



comprising both fuel oil and gasoline; and (d) recovering ethylene by flashing it off the higher boiling product.

4,227,993

CATALYSTS FOR THE HYDROTREATMENT OF HYDROCARBONS AND THEIR UTILIZATION

Philippe Engelhard; Georges Szabo, and Joseph E. Weisang, all of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Division of Ser. No. 758,670, Jan. 12, 1977, abandoned, which is a division of Ser. No. 597,987, Jul. 22, 1975, Pat. No. 4,039,477.
This application Mar. 6, 1979, Ser. No. 18,070
Claims priority, application France, Jul. 30, 1974, 74 26490
Int. Cl.³ C10G *35/08*
U.S. Cl. 208—139 **12 Claims**

1. A method comprising use of a catalyst in the reforming, in the presence of hydrogen, of hydrocarbon fractions whose sulfur content is under 10 ppm and whose boiling temperature at atmospheric pressure is between 35° and 250° C., said catalyst comprising a refractory mineral oxide carrier, a halogen element present in combined form, and containing metals in a free or combined state on said carrier as follows:

a. From 0.02 to 2% of at least one metal from the platinum group;

b. From 0.02 to 2% of tin; and

c. From 0.01 to 5% of at least one metal selected from the group consisting of scandium, yttrium, thorium, and uranium;

said percentages, determined relative to the respective elemental form, being based upon the total catalyst weight.

12. A method comprising use of a catalyst in the isomerization of hydrocarbons in the presence of hydrogen, said catalyst comprising a refractory mineral oxide carrier, a halogen element present in combined form, and containing metals in a free or combined state on said carrier as follows:

a. From 0.02 to 2% of at least one metal from the platinum group;

b. From 0.02 to 2% of tin; and

c. From 0.01 to 5% of at least one metal selected from the group consisting of scandium, yttrium, thorium, and uranium;

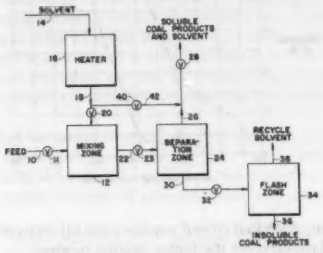
said percentages, determined relative to the respective elemental form, being based upon the total catalyst weight.

4,227,994

OPERATION OF A COAL DEASHING PROCESS

Alfred H. Knebel, and Donald E. Rhodes, both of Oklahoma City, Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Mar. 20, 1978, Ser. No. 887,870
Int. Cl.[2] C10G 21/20, 21/16, 21/14
U.S. Cl. 208—177 8 Claims



1. In a coal deashing process for separating a feed mixture into a light phase and a heavy phase having fluid-like properties within a separation zone, said separation zone being maintained at an elevated temperature and at a pressure greater than 550 psig. to effect said separation, said feed mixture being formed by contacting, in a mixing zone, a feed comprising soluble coal products and insoluble coal products with a solvent maintained at an elevated temperature and pressure, said feed mixture being in a ratio by weight of solvent to feed greater than one, said solvent consisting essentially of at least one substance having a critical temperature below 800 degrees F. selected from the group consisting of aromatic hydrocarbons having a single benzene nucleus and normal boiling points below about 310 degrees F., cycloparaffin hydrocarbons having normal boiling points below about 310 degrees F., open chain mono-olefin hydrocarbons having normal boiling points below about 310 degrees F., open chain saturated hydrocarbons having normal boiling points below about 310 degrees F., mono-, di, and tri-open chain amines containing from about 2–8 carbon atoms, carbocyclic amines having a monocyclic structure containing from about 6–9 carbon atoms, heterocyclic amines containing from about 5–9 carbon atoms, and phenols containing from about 6–9 carbon atoms and their homologs, said feed mixture being separated in said separation zone into said light phase and said heavy phase after which said light phase and said heavy phase are individually withdrawn from said separation zone, the improvements which comprise, during periods in which flow of said feed to said mixing zone is interrupted:

(a) providing an alternate solvent flow path by which the flow of said solvent maintained at elevated temperature and pressure is diverted from said mixing zone during said periods in which flow of said feed to said mixing zone is interrupted and is introduced into a conduit through which said light phase is withdrawn from said separation zone to maintain the elevated pressure within said separation zone; and

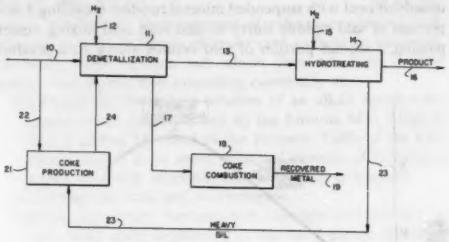
(b) maintaining the temperature level of said separation zone from which the flow of said solvent has been diverted at said elevated temperature while also maintaining said elevated pressure level to maintain the fluid-like properties of said heavy phase.

4,227,995

DEMETALLIZATION OF HYDROCARBON FEEDSTOCK

Morgan C. Sze, Upper Montclair, and Harvey D. Schindler, Fairlawn, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Dec. 6, 1978, Ser. No. 966,901
Int. Cl.[2] C10G 23/00
U.S. Cl. 208—251 H 21 Claims



1. A process for demetallizing a metal-containing hydrocarbon feedstock, comprising:

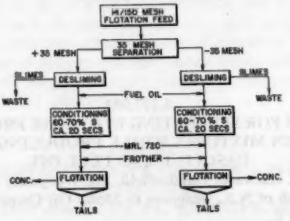
contacting said metal-containing hydrocarbon feedstock with hydrogen and a material having a porosity of less than 0.3 cc/gram, a surface area of less than 5 m^2/gram, an average pore diameter in excess of 1,000 °A. and a pore distribution in which at least 40% of the pores have a size of greater than 10,000 °A., at least 60% of the pores have a size in excess of 1,000 °A., and less than 20% of the pores have a size of less than 100 °A., said contacting being effected at demetallization conditions to deposit metals present in said feedstock on said material.

4,227,996

FLOTATION PROCESS FOR IMPROVING RECOVERY OF PHOSPHATES FROM ORES

Nathan M. Levine, and Walter Von Drathen, both of Louisville, Ky., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,656
Int. Cl.[2] B03B 7/00
U.S. Cl. 209—12 20 Claims



1. A process for recovering phosphate values from deslimed phosphate ore, containing bone phosphate of lime and passing a 14 mesh screen, that comprises the following steps for treating said ore: conditioning with a fuel oil, treating with a polyamine cationic collector and a frother, and frothing with air to remove silica particles from said ore in at least two floats having no pH adjustment step, no scrubbing step, and no oil removal step therebetween, said ore being recovered as at least two concentrate products containing at least 80% of said bone phosphate of lime and having insol values no greater than about 6% wherein said cationic collector is a composition which corresponds to the formula:

$$NH_2\text{-}(CH_2\text{-}CH_2\text{-}\underset{\displaystyle R}{\underset{|}{N}}\text{-})_n CH_2\text{-}CH_2\text{-}NH_2$$

where R is an aliphatic substituent containing between about 8–24 carbon atoms and between about 1–3 oxygen atoms and is derived from a monoepoxide, n is the integer 1 or 2, and one of the R substituents can be hydrogen when n is 2.

4,227,997

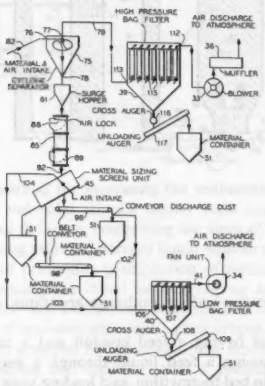
MOBILE NON-POLLUTING CLEANING AND PROCESSING APPARATUS AND METHOD

Roland E. Shaddock, Streator, Ill., assignor to Peabody-Myers Corporation, Streator, Ill.

Filed Dec. 14, 1978, Ser. No. 969,325

Int. Cl.[2] B07B *9/00*

U.S. Cl. 209—250 **20 Claims**



20. The method of cleaning and classifying granular material which comprises pulling granular material from a source into a high pressure airstream, centrifugally separating the granular material from dust in said airstream, filtering the dust in said airstream, classifying the separated granules into a plurality of batches of different sizes, pulling dust from the granules being classified into a second and lower pressure airstream, filtering the dust from the second airstream, and aspirating air from the separated batches of the granules to avoid pollution as the granules are discharged.

4,227,998

WASTE DISPOSAL TREATMENT OF CALCIUM-CONTAINING ORGANICALLY LOADED WASTEWATERS

Hans Reimann, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 15, 1978, Ser. No. 933,838

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 2738309

Int. Cl.[2] C02C *1/06*

U.S. Cl. 210—609 **9 Claims**

1. In a process for the treatment of calcium ion containing, organically loaded wastewater, wherein the wastewater has a pH of 10–12, contains 300–5,000 mg Ca^{++} per liter, and is from settling tanks containing the wastewater from the flushing and wash water cycle of a sugar manufacturing plant, which comprises subjecting said wastewater to an activated sludge process under aeration with an O_2-containing gas in an aeration tank, the improvement which comprises introducing a CO_2-containing gas having a concentration of at least 5% by volume of CO_2 to lower and maintain the liquid present in the aeration tank at a pH of 6–8 and to precipitate therein said calcium ion as calcium carbonate, the components in the wastewater and the CO_2-introduction being such that the concentration of dry activated sludge matter is increased to above 8 kg/m^3 and the proportion of organic substance therein, defined as the incineration loss, is maintained at 30–70% by weight, said improvement facilitating the separation of the activated slude solids and the bacterial action of the activated sludge process.

4,227,999

ULTRAFILTRATION PROCESS AND APPARATUS

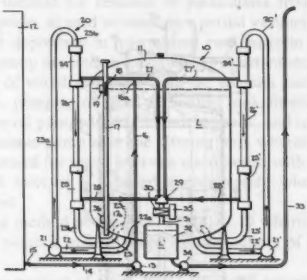
Heinrich Ebner, Bonn-Ippendorf, Fed. Rep. of Germany, assignor to Heinrich Frings GmbH & Co. KG, Bonn, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,261

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2808022

Int. Cl.[3] B01D *13/00, 31/00*

U.S. Cl. 210—650 **11 Claims**



1. In a process for the continuous ultrafiltration of liquids, wherein (a) the liquid to be filtered is circulated from and back to a circulating tank through at least one filtration circuit, (b) each filtration circuit is provided with a respective plurality of serially connected filter modules each having an inlet and an outlet for the liquid being filtered, (c) each of said filter modules gives rise, under the conditions of the process, to a substantial drop of the hydrostatic pressure prevailing at its inlet, (d) filtered liquid is extracted from each filter module intermediate the inlet and outlet of the same, and (e) the liquid level in the circulating tank is maintained substantially constant by replenishment of the liquid to be filtered as required;

the improvement comprising that:

(A) in each filtration circuit (i) each of the serially connected filter modules defines a non-horizontal path of flow for the liquid to be filtered, each of said filter modules has its inlet at the top and its outlet at the bottom, and each outlet is located above the level of the inlet of the respective next lower filter module, and (ii) the liquid to be filtered flows in sequence through all of the associated filter modules downwardly from the top to the bottom of each of the same,

(B) a hydrostatic pressure of between 200 and 700 mbar is established and maintained at the inlet of the uppermost first filter module in each filtration circuit,

(C) the liquid exiting from the outlet of the upper one of each two successive filter modules of each filtration circuit is permitted to flow downwardly in a non-horizontal path to the inlet of the respective next lower filter module substantially without pressure loss through a respective fall interval zone arranged between each two successive filter modules, the height of each such fall interval zone being such (i) that the pressure drop occurring in the upper one of each two successive filter modules is equalized, to the extent of from 0.5 to 1.5 times, by the weight of the liquid column in the associated fall interval zone immediately

therebelow and (ii) that as a consequence about the same hydrostatic pressure is established and maintained at the inlet of the lower one of each two successive filter modules as at the inlet of the upper one, and

(D) the hydrostatic pressure at the outlet of the lowermost last filter module in each filtration circuit is established and maintained at between 100 and 400 mbar as a function of the weight of the liquid column in said circulating tank above the level of said outlet of said last filter module.

4,228,000

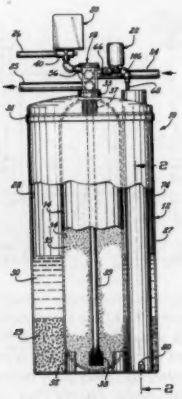
WATER TREATMENT APPARATUS WITH MEANS FOR AUTOMATIC DISINFECTION THEREOF

Frank A. Hoeschler, 5840 N. Scottsdale Rd., Scottsdale, Ariz. 85253

Continuation-in-part of Ser. No. 603,280, Aug. 11, 1975, abandoned. This application Jan. 8, 1979, Ser. No. 2,071

Int. Cl.[3] **B01J** *20/34, 49/00*

U.S. Cl. 210—673 **13 Claims**



11. A method for disinfecting a water treatment apparatus of the type fixedly mounted between the supply segment and the delivery segment of a pressurized water line, said method comprising the steps of:

(a) directing water from the supply segment of said water line through said water treatment apparatus to the delivery segment of said water line during a water treating operational mode of said water treatment apparatus and directing a predetermined amount of water into a disinfectant dispenser vessel at the beginning of the water treating operational mode to dissolve a portion of water soluble disinfectant agent in solid form contained therein to form a saturated disinfectant agent solution in said dispenser vessel;

(b) terminating the water treating operational mode of said water treatment apparatus after step a to provide a regenerating operational mode in which said water treatment apparatus is hydraulically isolated from the delivery segment of said water line and water from the supply segment of said water line is directed through said water treatment apparatus for regenerating purposes;

(c) extracting the disinfectant agent solution from said dispenser vessel at the beginning of the regenerating operational mode of said water treatment apparatus; and

(d) mixing the extracted disinfectant agent solution with the water that is being directed through said water treatment apparatus for regenerating purposes to complete the disinfection of said water treatment apparatus.

4,228,001

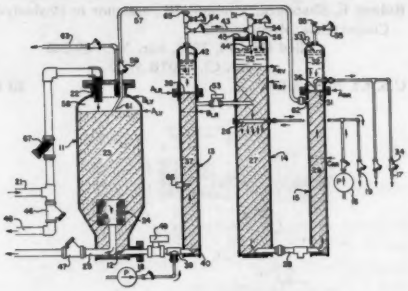
FOLDED MOVING BED ION EXCHANGE APPARATUS AND METHOD

Lee G. Carlson, Willow Springs, Ill., assignor to American Petro Mart, Inc., Bartow, Fla.

Filed Apr. 12, 1978, Ser. No. 895,817

Int. Cl.[2] **B01D** *15/02*

U.S. Cl. 210—676 **28 Claims**



1. A packed moving-bed ion exchange apparatus, comprising:

a loading vessel having a feed conduit and a collecting means for passing a feed liquid through a packed ion exchange resin bed therewithin, said loading vessel having a resin inlet and a resin outlet;

a loading reservoir in resin-passing communication with said resin inlet of the loading vessel through a transfer conduit and through a resin valve between said resin inlet of the loading vessel and said transfer conduit, said loading reservoir containing a movable packed resin bed;

a regeneration vessel in resin-passing communication with said loading reservoir, said regeneration vessel having a movable packed resin bed and a liquid distribution head therewithin, said distribution head being below said communication of the regeneration vessel to the loading reservoir;

a regeneration reservoir in resin-passing communication with said regeneration vessel at a location below said distribution head, said regeneration reservoir having a movable packed resin bed therewithin;

pumping means for passing regenerating solution into said regeneration vessel through said distribution head;

pumping means for moving rinse liquor through said resin bed of said loading reservoir, said pumping means having an outlet opening into said transfer conduit, said pumping means outlet being closed to said loading vessel by said resin valve for pumping said rinse liquor together with a plug of resin upwardly into said loading reservoir;

pneumatic means in association with said regeneration vessel for laminarly moving a portion of the resin bed within said regeneration vessel into said loading reservoir to pass resin from said loading reservoir into said loading vessel; and

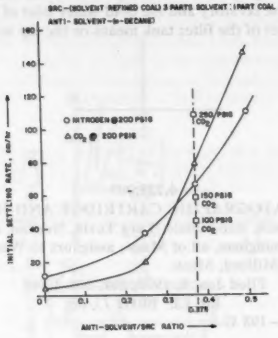
a resin slurry transfer conduit communicating said resin outlet of the loading vessel with said regeneration reservoir.

4,228,002

ENHANCED ANTI-SOLVENT SEDIMENTATION OF SOLIDS FROM LIQUIDS USING PRESSURIZED CARBON DIOXIDE GAS

Kumbakonam R. Vaidyanathan; Joseph D. Henry, Jr., and Francis H. Verhoff, all of Morgantown, W. Va., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 15, 1978, Ser. No. 942,742
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—729 7 Claims



1. A method for increasing the sedimentation of asphaltic material and solid mineral matter from coal-derived liquid containing the same, comprising the steps of:

(a) mixing said coal-derived liquid with an anti-solvent capable of promoting precipitation of asphaltic material and enhancing the initial settling rate of said solid mineral matter, said anti-solvent selected from the group consisting of saturated noncyclic hydrocarbons, cyclic hydrocarbons, aromatic hydrocarbons, and mixtures thereof, and

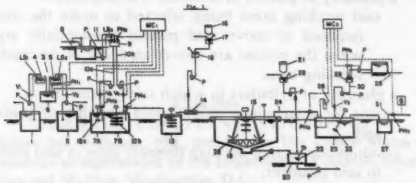
(b) holding said mixture under a pressurized atmosphere having carbon dioxide as its major component by volume to precipitate and settle said asphaltic material and said solid mineral matter from said coal-derived liquid.

4,228,003

METHOD OF REMOVING PHOSPHATES FROM WASTE WATER

Yutaka Makino, Takasago, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 17, 1979, Ser. No. 30,873
Claims priority, application Japan, Apr. 21, 1978, 53/48159; Jun. 30, 1978, 53/79894
Int. Cl.[2] C02C *5/02*
U.S. Cl. 210—725 6 Claims



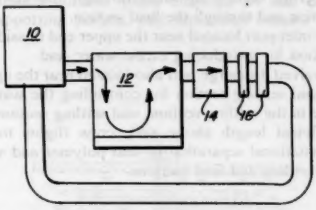
1. A method of removing phosphates from waste water which comprises admixing the waste water with seawater in a volume ratio of 95:5 to 50:50 and adjusting the mixture to pH 9-11 with an alkaline agent to separate the sedimental phosphates by way of coagulation.

4,228,004

METHOD AND APPARATUS FOR REMOVAL OF BY-PRODUCTS OF CHEMICAL VAPOR DEPOSITION FROM OIL FOR VACUUM PUMP

Robert B. Foster, Riverside, Calif., assignor to Thermco Products Corporation, Orange, Calif.

Filed Apr. 12, 1979, Ser. No. 29,525
Int. Cl.[2] B01D *23/24*
U.S. Cl. 210—739 32 Claims



16. A method for removal of particulates from oil for a vacuum pump, as used to maintain a partial vacuum for chemical vapor deposition in intermittent runs wherein oil for the vacuum pump becomes contaminated by particulates, comprising steps of withdrawing oil from the vacuum pump to a settling tank, pumping oil from the settling tank, filtering particulates from oil pumped from the settling tank, and returning oil to the vacuum pump after the filtering step, wherein said steps are performed for timed intervals coordinated with the runs so that each interval is initiated approximately when a run is terminated.

30. The method of claim 16, 17, 18, or 19 wherein oil in the vacuum pump is contaminated by particulates of ammonium chloride.

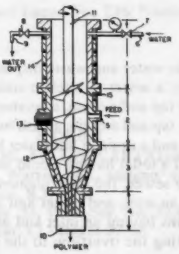
31. The method of claim 16, 17, 18, or 19 comprising a step of displacing sediment from the settling tank between such intervals, while the vacuum pump may continue to operate.

4,228,005

MECHANICAL DEWATERING APPARATUS FOR ELASTOMER SLURRIES

Robert A. Covington, Jr., and Okan M. Ekiner, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 801,370, May 27, 1977, Pat. No. 4,132,845.
This application Jun. 19, 1978, Ser. No. 916,913
Int. Cl.[2] B01D *21/14;* C08F *6/22*
U.S. Cl. 210—207 6 Claims



1. Apparatus for the isolation of a heavier-than-water polymer from a mixture of said polymer in water, comprising:

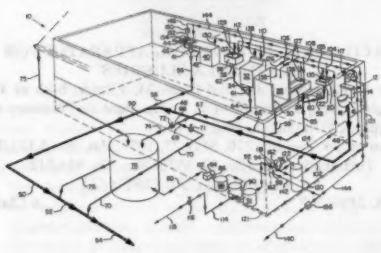
(a) a vertically disposed separator having:

(1) an upper settling section;

(2) a cylindrical feed section located below said settling

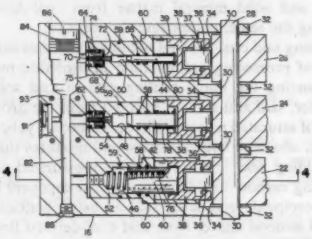
section and having a feed port through which the said polymer-water mixture may be introduced;
(3) means for feeding said mixture through the said feed port;
(4) a conical compression section located below said feed section; tapering into
(5) a bottom cylindrical metering section having a discharge port located at its bottom end;
(6) a rotating screw located inside said separator having helical flights extending from the bottom end of the metering section upwards through the compression section and through the feed section;
(7) an inlet port located near the upper end of said settling section for introducing excess water; and
(8) a valved discharge port also located near the upper end of said settling section for controlling the water pressure in the settling section, said settling section having sufficient length above said screw flights to permit gravitational separation of said polymer and water in the settling and feed sections.

4,228,006
DOMESTIC WATER SYSTEM
Daniel C. Hanna, P.O. Box 3736, Portland, Oreg. 97208
Continuation of Ser. No. 817,735, Jul. 21, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,329
Int. Cl.[2] B01D *17/08, 21/00*
U.S. Cl. 210—167 **5 Claims**



1. In a domestic water and waste disposal system including a tap water supply, a sewer, a kitchen sink having a hot water tap, a cold water tap and a drain, a lavatory having a hot water tap, a cold water tap and a drain, a bath having a hot water tap, a cold water tap and a drain, a hot water heater having an inlet and an outlet and a toilet having a cold water inlet and a drain connected to the sewer, the improvement comprising a clarifier tank having an inlet, and outlet and an overflow,
filter tank means having an inlet and an outlet,
means connecting the overflow to the sewer,
pump means,
means connecting the inlet of the filter tank means to the pump means,
means connecting the pump means to the outlet of the clarifier tank,
selectively operable means connected by means to the drain of the bath and the lavatory for connecting the drains of the bath and the lavatory to the sewer or to the inlet of the clarifier tank,
means for selectively connecting the inlet of the hot water heater to the tap water supply or the outlet of the filter tank means,
means connecting the outlet of the heater to the hot water taps of the bath and the lavatory,
means connecting the tap water supply directly to the cold water tap of the kitchen sink, and means for selectively connecting the cold water tap of the bath, the cold water tap of the lavatory and the cold water inlet of the toilet to the outlet of the filter tank means or the tap water supply.

4,228,007
CHROMATOGRAPHIC CARTRIDGE AND HOLDER
Carl W. Rausch, Auburndale; Yury Tuvin, Newton, and Uwe D. Neue, Framingham, all of Mass., assignors to Waters Associates, Inc., Milford, Mass.
Filed Jan. 8, 1979, Ser. No. 1,540
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C **10 Claims**



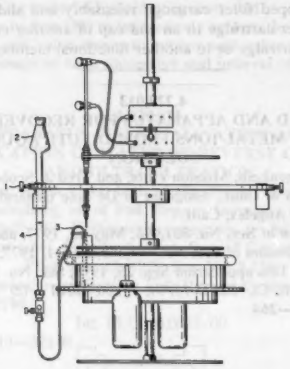
1. Apparatus for radially compressing the wall of a chromatography cartridge containing chromatographic packing material, said apparatus comprising:
means for introducing the chromatographic fluid to the inlet of said cartridge,
means for removing the chromatographic fluid from the outlet of said cartridge,
chamber means surrounding said wall of said cartridge,
pressure generating means communicating with said chamber means, said pressure generating means including
a plurality of pistons of different working areas,
said working areas being selected to make the forces required to move said pistons substantially equal when the pistons are moved in order of descending working area,
a plurality of cylinders in which said pistons move,
means for sequentially moving said plurality of pistons, and
conduits connecting the high pressure sides of said pistons to said chamber,
whereby when said apparatus is filled with working fluid, said means for moving said pistons may be operated to raise in stages the pressure in said chamber and thereby reach the desired pressure for radially compressing said cartridge with lower forces applied to said pistons than would otherwise be required.

4,228,008

CHROMATOGRAPHIC DEVICE FOR SIMULTANEOUS COLLECTION AND EVAPORATION OF SEQUENTIAL VOLATILE NON-AQUEOUS ELUATES

Robert J. Karol, Andover, and Raymond E. Grew, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 5, 1979, Ser. No. 27,345
Int. Cl.[3] B01D *15/08*
U.S. Cl. 210—198 C 5 Claims



1. A chromatographic device for the simultaneous collection and evaporation of sequential volatile organic eluates which comprises:

a. a column for receiving sample to be separated,
b. a means for retaining said column,
c. a separating matrix disposed within said column,
d. a column delivery tube at the lower end of said column,
e. a receptacle for receiving eluate, said vessel affixed in such a position to allow for communication of said vessel with the terminal end of said column delivery tube,
f. a container for receiving eluate, said container having inlet means at several points and being positioned to allow for communication of said inlet means with the terminal end of said column delivery tube,
g. an evaporating gas source, said source positioned to allow communication within said receptacle for receiving eluate,
h. a means for maintaining a constant temperature in which is placed said receptacle for receiving eluate,
i. a means for controlling the rate of flow of said eluate,
j. a means for housing said device.

4,228,009

TOROIDAL COIL PLANET CENTRIFUGE

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jun. 4, 1979, Ser. No. 45,052
Int. Cl.[3] B01D *15/08*
U.S. Cl. 210—198 C 12 Claims

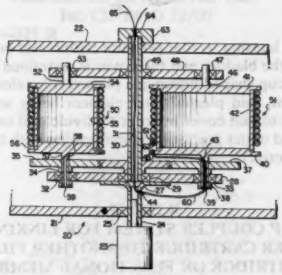
1. A toroidal coil planet centrifuge, comprising:

a support means provided with upper and lower stationary members;

rotary frame means provided with upper and lower plate portions and mounted between said stationary members for rotation about a first vertical axis;

at least one coil means mountcd between said upper and lower plate members around a second vertical axis, said second vertical axis being spaced from said first vertical axis by distance R, and said coil holder means having a substantially cylindrical separation column supporting surface spaced from said second axis by distance r, the ratio of r to R being greater than 0.25;

separation column means mounted on said coil holder supporting surface, said separation column means including a flexible core member and at least one tube having ends at least one tube wound in a helix about said flexible core member;



inlet and outlet tubes connected to respective said ends of said at least one tube;

tube holding means located within said rotary frame means for holding said inlet and outlet tubes so that the orientation thereof remains constant;

drive means for rotating said frame means and said coil holder means; and

counterbalancing means mounted on said frame means opposite said coil holder means.

4,228,010

Patent Not Issued For This Number

4,228,011

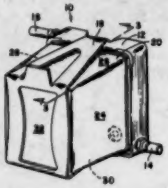
FUEL OIL FILTER CARTRIDGE

Edmond H. Cote, Jr., Warren, R.I., assignor to Fram Corporation, East Providence, R.I.

Filed Apr. 23, 1979, Ser. No. 32,081
Int. Cl.[2] B01D *27/06*
U.S. Cl. 210—232 9 Claims

1. In a liquid filter having a base carrying inlet and outlet ports, a cup-shaped housing cooperating with said base to define a liquid receiving chamber communication with said inlet and outlet ports, and retaining means for removably securing the housing to a cover, a filter cartridge including said cover clamped between said cup-shaped housing and said base,

said cover having an inlet and an outlet communicating with the inlet port and outlet port respectively, and a semi-rigid bladder having an open end sealed to said cover to define a fluid pressure receiving compartment, said bladder being shaped complementary to the shape of the inside of said housing so that when the filter cartridge is installed in said chamber the bladder is supported and is restrained by the wall of said



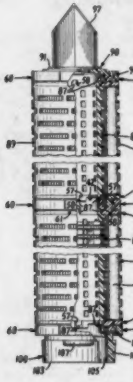
cup-shaped housing so that pressure within said compartment defined by the bladder and the cover is restrained by the support of the cup-shaped housing, a pleated filter element in said compartment, said pleated filter element being sealed to the bladder and to said cover in order to divide said compartment into inlet and outlet portions communicating with the inlet and outlet respectively.

4,228,012

END CAP COUPLER SYSTEM FOR LINKING ONE FILTER CARTRIDGE TO ANOTHER FILTER CARTRIDGE OR FUNCTIONAL MEMBER

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,813
Int. Cl.[2] B01D *27/00, 29/24*
U.S. Cl. 210—238 **54 Claims**



1. A slide-on end cap coupler for linking an end-capped filter cartridge to another end-capped filter cartridge or to another functional member at the end cap thereof, comprising, in combination:

(1) first and second attaching members, each having first and second opposed faces,

(a) a first face of each attaching member facing one end of a filter cartridge or other functional member; and

(b) a second face of each attaching member being adapted for closely-abutting contact with the second face of the other attaching member;

(2) an outer periphery of the second face terminating in an outwardly extending flange, the flange of each member being adapted for closely-abutting contact when the second faces of each member are in closely-abutting contact;

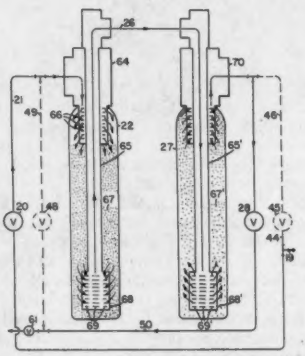
(3) at least two intermeshing clamping channel members having channel sides shaped to slidably move into and away from a clamping position in which the sides circumferentially embrace the abutting flanges of the attaching members and spaced apart sufficiently to engage the flanges and clamp the attaching members together; each channel member having intermeshing locking means engaging mating locking means of the other member and releasably locking the channel members together in such clamping and embracing position; and in such position embracing substantially the entire periphery of the flanges; whereby each of the first and second attaching members when a part of or attached to one end cap of an end-capped filter cartridge releasably and slidably links the filter cartridge to an end cap of another end-capped filter cartridge or to another functional member.

4,228,013

METHOD AND APPARATUS FOR RECOVERY OF HEAVY METAL IONS FROM DILUTE AQUEOUS SOLUTION

David J. Degenkolb, Mission Hills, and Fred J. Scobey, Hollywood, both of Calif., assignors to De luxe General, Incorporated, Los Angeles, Calif.

Continuation of Ser. No. 801,493, May 13, 1977, abandoned, which is a division of Ser. No. 764,669, Feb. 1, 1977, Pat. No. 4,137,290. This application Sep. 25, 1978, Ser. No. 945,652
Int. Cl.[2] B01D *15/04, 15/06;* **B01J** *1/09*
U.S. Cl. 210—264 **9 Claims**



3. Apparatus for recovering a heavy metal ion and a coagulant from a dilute aqueous solution, comprising;

(a) a pair of interconnected closed ion-exchange vessels (**22,27**),

(b) exclusively ion-absorbing material (**67,67'**) in each of said vessels,

(c) centrally disposed means to pass (**21,26,47**) said dilute aqueous solution serially through said vessels;

(1) a first part of said means to pass extending through the tops of said vessels and having a large plurality of separate groups of contiguously disposed circumferentially aligned circularly symmetrical slit orifices (**68**) at the bottoms of said vessels to cause upward physical agitation of said ion-absorbing material to expand said ion-absorbing material to the top of said ion-exchange vessel when the flow is outward from said orifices (**68**) at the bottom of a said vessels,

(2) a second part of said means to pass surrounding said first part at the tops of said vessels and having a large plurality of separate groups of contiguously disposed circumferentially aligned circularly symmetrical slit orifices (**66**) at the tops of said vessels,

(3) said orifices in said means to pass at the bottom and the

top of said vessels being uniformly disposed at one radius approximately half-way between the walls of said vessels and said first and second means to pass,

to directly disperse a distributed flow of said aqueous solution from said means to pass radially into said ion-absorbing material,

(d) a plurality of valve means (**20,28,45,48**) separately disposed in said means to pass only said solution,

(e) half of said plurality of valve means to automatically actuate (**52,53**) all of said plurality of valve means after the passage of an interval of time of approximately an hour, so as to reverse the direction of flow of further said solution through said vessels to prevent clogging of said ion-absorbing material by said coagulant, and

(f) means to time (**51**) to successively actuate the half plurality of said valve means to actuate said valve means after the passage of each successive said interval of time.

4,228,014

APPARATUS FOR DESALINATION AND PURIFICATION OF WATER BY REVERSE OSMOSIS AND ULTRAFILTRATION

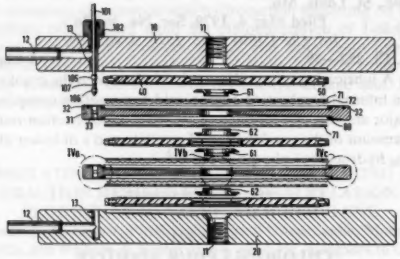
Hans Timm; Sören Fries, both of Geesthacht, and Axel Wenzlaff, Escheburg, all of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,221

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802780

Int. Cl.[2] **B01D** *13/00*

U.S. Cl. 210—321 R **13 Claims**



1. An apparatus for the desalination and purification of water by reverse osmosis and ultrafiltration in a closed system which is stationary and continuously operable to hold back salt as well as suitable for high pressure required for economically gaining useful water, which comprises in combination:

two end plates respectively provided with a peripheral axially directed bore, at least one of which passes entirely through the pertaining end plate;

dish-like carrier plates and water guide plates which are alternately stacked one above the other and are held together between said end plates to form a stack held together at the peripheral region of all of said plates, said stack having a continuous central axially oriented aperture for the introduction of untreated water through an inlet at one end of said stack, said carrier plates sealingly engaging one another by means of thickened marginal portions thereof located radially outwardly of the peripheral edgesx of said guide plates, said marginal portions being respectively provided with a continuous axially directed bore, the respective bores of said marginal portions being aligned with one another and with the bores of said end plates to provide an outlet for permeate;

annular diaphragms respectively arranged between respective carrier plates and guide plates; said diaphragms being water permeable and being acted upon exclusively by pressure of untreated water which is introduced; and

filter layers respectively located between respective diaphragms and carrier plates to allow untreated water to flow over said diaphragms in a radial direction on that side of said diaphragms opposite said filter layers, and to allow permeate to be drawn off on that side of said diaphragms adjacent said filter layers, said marginal portions of said carrier plates being provided with gaps respectively provided on their axially directed surfaces radially inwardly of said marginal portion bores so that said last mentioned bores communicate with the pertaining filter layers.

4,228,015

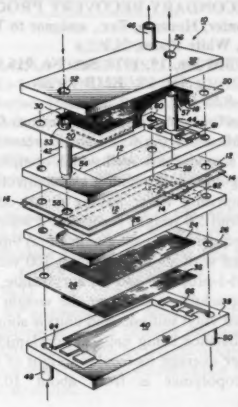
PLASMA TREATMENT APPARATUS

James H. De Vries, McHenry, and Gaylord L. Berry, Mundelien, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 29, 1979, Ser. No. 7,487

Int. Cl.[2] **B01D** *13/00*

U.S. Cl. 210—321 R **13 Claims**



1. Plasma treatment apparatus in which whole blood is filtered through a microporous membrane having a pore size between 0.1 micron and 2 microns thereby providing a plasma filtrate, the improvement comprising, in combination:

a filter cell assembly including said microporous membrane;

said filter cell assembly having a membrane support member and a treatment membrane supported by said membrane support member;

a plasma treatment agent sandwiched between said membrane support member and said treatment membrane;

said treatment membrane being spaced from said microporous membrane to form a plasma chamber therebetween;

said treatment membrane being operable to permit transfer between said treatment agent and the plasma in said plasma chamber;

means for introducing whole blood to one side of said microporous membrane; and

means for withdrawing treated plasma from said plasma chamber.

4,228,016

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,983

Int. Cl.[2] **E21B** *43/22*

U.S. Cl. 252—8.55 D **8 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble copolymer of acrylamide-vinyl sulfonic acid or the sodium, potassium or ammonium salt thereof alkoxylated with about 2 to about 100 weight percent of 2,3-epoxy-1-propanol, wherein in the said water-soluble copolymer the weight percent of the acrylamide units is about 65 to about 95 with the balance being units of vinyl sulfonic acid or the sodium, potassium or ammonium salt thereof and wherein the number average molecular weight of the said water-soluble copolymer is from about 10,000 to about 2,000,000,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well.

4,228,017

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,984

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **10 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble copolymer comprising repeating units of (a) vinyl sulfonic acid alkoxylated with about 2 to about 100 weight percent of 2,3-epoxyl-1-propanol and (b) acrylamide, wherein in the said water-soluble copolymer the weight percent of the alkoxylated vinyl sulfonic acid units is about 5 to about 35 with the balance being units of acrylamide and wherein the number average molecular weight of the said water-soluble copolymer is from about 10,000 to about 2,000,000,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well.

4,228,018

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 916,986

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **10 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble copolymer of acrylamide-vinyl sulfonic acid or the sodium, potassium or ammonium salt thereof alkoxylated with a material selected from the group consisting of (a) ethylene oxide and (b) a mixture of ethylene oxide and propylene oxide, wherein in the said mixture the weight percent of ethylene oxide is about 60 to about 95, wherein in the said water-soluble copolymer the weight percent of the acrylamide units is about 65 to about 95 with the balance being units of vinyl sulfonic acid or the sodium, potassium or ammonium salt thereof and wherein the number average molecular weight of the said water-soluble copolymer is from about 10,000 to about 2,000,000,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well.

4,228,019

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,051

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D **10 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(a) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble copolymer comprising repeating units of (a) vinyl sulfonic acid alkoxylated with about 2 to about 100 weight percent of a material selected from the group consisting of (I) ethylene oxide and (II) a mixture of ethylene oxide and propylene oxide wherein in the said mixture the weight percent of ethylene oxide is about 60 to about 95 and (b) acrylamide, wherein in the said water-soluble copolymer the weight percent of the alkoxylated vinyl sulfonic acid units is about 5 to about 35 with the balance being units of acrylamide and wherein the number average molecular weight of the said water-soluble copolymer is from about 10,000 to about 2,000,000.

4,228,020

LUBRICATING OIL COMPOSITION

Andrew G. Papay, Manchester, Mo., assignor to Edwin Cooper, Inc., St. Louis, Mo.

Filed May 4, 1979, Ser. No. 36,074

Int. Cl.[2] C10M *1/46, 1/10, 3/40, 3/02*

U.S. Cl. 252—29 **4 Claims**

1. A lubricating composition suitable for use in the crankcase of an internal combustion engine, said composition comprising a major amount of a lubricating oil and a minor friction-reducing amount of the combination of graphite and a di-lower alkyl C_{6-36} hydrocarbyl phosphonate.

4,228,021

CHLORO-SULPHUR ADDITIVE

Alain L. P. Lenack, Mont-Saint-Aignan, France, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 801,027, May 27, 1977, abandoned, which is a continuation-in-part of Ser. No. 639,865, Dec. 11, 1975, abandoned. This application Jan. 8, 1979, Ser. No. 1,411

Claims priority, application United Kingdom, Dec. 17, 1974, 54398/74

Int. Cl.[2] C10M *1/46, 1/38*

U.S. Cl. 252—32.7 R **17 Claims**

1. An extreme pressure lubricating composition comprising a major proportion of lubricating oil, about 0.1 to 10 wt. % of an extreme pressure compound of the formula:

$$Cl_3C—S—S—R$$

wherein R is an alkyl radical containing 4 to 30 carbon atoms, said extreme pressure compound tending to liberate HCl; and about 0.5 to 5% by weight, based on the weight of said extreme pressure compound, of an oil soluble basic stabilizer which acts as an acid trap by reacting with said HCl and inhibits liberation of chlorine and sulphur from said extreme pressure compound at temperatures below 200° C.

6. A composition according to claim **1**, containing in addition, about 0.5 to 10% by weight, based on the weight of said extreme pressure compound, of an anti-rust agent which is soluble in the oil and which differs from said stabilizer.

4,228,022

SULFURIZED ALKYLPHENOL-OLEFIN REACTION PRODUCT LUBRICATING OIL ADDITIVE

Warren Lowe, El Cerrito, and Thomas V. Liston, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 28, 1979, Ser. No. 53,114
Int. Cl.[2] C10M *1/54*
U.S. Cl. 252—42.7 7 Claims

1. An additive composition for use in crankcase lubricating oils comprising the reaction product of: (a) an alkylphenol; (b) sulfur; (c) an alkali or alkaline earth metal salt and (d) an olefin; said reaction product being formed under reaction conditions suitable to form a reaction product containing less than 1.0 weight percent free-sulfur.

6. A lubricating oil additive concentrate which comprises from 90–10 percent weight of an oil of lubricating viscosity and 10–90 percent weight of the composition of claim 1.

7. A lubricating oil composition of claim 1, comprising an oil of lubricating viscosity and an antioxidant amount of the composition of claim 1.

4,228,023

PARAFFINIC INSULATING OILS CONTAINING A DIARYLALKANE

Johann G. D. Schulz, Pittsburgh; Anatoli Onopchenko, Monroeville, and William A. Kofke, Irwin, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 25, 1978, Ser. No. 954,592
Int. Cl.[2] H01B *3/22*
U.S. Cl. 252—63 4 Claims

1. A novel insulating oil composition comprising a hydrocarbon insulating oil, wherein said hydrocarbon insulating oil is a paraffinic oil obtained from the oligomerization of 1-olefins having from six to 14 carbon atoms, and from about five to about 20 weight percent of a diarylalkane selected from the group consisting of 1,1-di(4-methylphenyl) ethane and 1,1-di(3,4-dimethylphenyl) ethane.

4,228,024

INSULATING OIL COMPOSITIONS CONTAINING A FRACTION DERIVED FROM THE ALKYLATION PRODUCT OF BENZENE WITH ETHYLENE

Johann G. D. Schulz, Pittsburgh; Anatoli Onopchenko, Monroeville, and William A. Kofke, Irwin, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 25, 1978, Ser. No. 954,593
Int. Cl.[2] H01B *3/22*
U.S. Cl. 252—63 7 Claims

1. A novel insulating oil composition comprising a major amount of a naphthenic hydrocarbon insulating oil and a minor amount of a product obtained as a result of a process which comprises reacting benzene with ethylene in the presence of an alkylation catalyst to obtain a reaction mixture containing largely unreacted benzene, ethylbenzene, polyethylbenzenes, 1,1-diphenylethane and heavier material, separating at least benzene, ethylbenzene and polyethylbenzenes from said reaction mixture and thereafter recovering from said heavier material a fraction whose boiling points fall within a temperature range of about 255° to about 420° C. as said product.

4,228,025

AGGLOMERATION PROCESS FOR MAKING GRANULAR DETERGENTS

Ronald L. Jacobsen, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1979, Ser. No. 53,574
Int. Cl.[2] C11D *3/075, 3/08, 3/395, 11/00*
U.S. Cl. 252—99 7 Claims

1. A process for preparing an agglomerated granular detergent composition comprising at least about 15% sodium tripolyphosphate by weight, from about 50% to about 99.5% by weight of inorganic materials selected from the group consisting of alkali metal polyphosphates, orthophosphates, chlorinated orthophosphates, silicates, carbonates, sulfates and mixtures thereof and from 0% to about 20% of a surfactant, in which the agglomerating agent comprises an alkali metal silicate solution having a water content of from about 50% to about 75%, an average SiO_2:M_2O weight ratio of from about 1.6 to about 3.3, M being an alkali metal, said process comprising:

(a) the addition of the agglomerating agent to a first portion of the sodium tripolyphosphate consisting of from about 50% to about 95% of the total sodium tripolyphosphate in the detergent composition, said first portion having a particle size distribution such that at least 30% by weight is retained on a 100 Tyler mesh screen, and

(b) the addition of a second portion of sodium tripolyphosphate to a mixture of the first portion of sodium tripolyphosphate and the agglomerating agent after at least about 30% of the agglomerating agent has been added to the first portion of sodium tripolyphosphate.

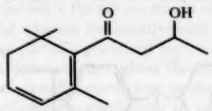
4,228,026

3-HYDROXY-1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1-BUTANONE IN DETERGENTS

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y.; Frederick L. Schmitt, Holmdel, and Edward J. Granda, Englishtown, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 942,573, May 17, 1978, abandoned, which is a division of Ser. No. 872,975, Jan. 27, 1978. This application May 15, 1979, Ser. No. 39,116
Int. Cl.[2] C11D *3/50, 9/44*
U.S. Cl. 252—174.11 2 Claims

1. A process for augmenting or enhancing the aroma of a solid or liquid detergent which consists essentially of adding thereto from 0.005% up to 3.0% by weight of said detergent of 3-hydroxy-1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-1-butanone having the structure:



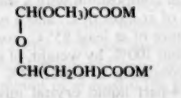
4,228,027

DETERGENT COMPOSITIONS

Vincent Lamberti, Upper Saddle River, and Mark D. Konort, Haworth, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 770,334, Feb. 22, 1977, which is a division of Ser. No. 226,213, Feb. 14, 1972, Pat. No. 4,025,450, which is a continuation-in-part of Ser. No. 187,115, Oct. 6, 1971, abandoned. This application Oct. 23, 1978, Ser. No. 954,023
Int. Cl.[2] C11D *3/20*
U.S. Cl. 252—174.19 4 Claims

1. A detergent composition consisting essentially of a water-soluble organic detergent compound selected from the group consisting of anionic, nonionic, and ampholytic detergent compounds and a detergent builder compound of the general formula:



wherein M and M' are selected from the group consisting of

alkali metal, ammonium, methyl ammonium (tetramethyl) ammonium, normal monoethanolamine, diethanolamine, triethanolamine salts, normal monoisopropanol amine salts, normal diisopropanolamine salts and normal monopholine salts, the weight ratio of detergent builder to detergent compound varying from about 1:20 to about 50:1.

4,228,028

BALL POINT PEN, INK, AND ITS ERADICATOR SYSTEM

An-Chung R. Lin, Fairport, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 784,653, Apr. 4, 1977, Pat. No. 4,156,657. This application Nov. 13, 1978, Ser. No. 960,359

Int. Cl.[3] **B43K** *27/12, 7/00;* **C09D** *11/18*

U.S. Cl. 252—188.3 R **1 Claim**

1. An eradicator for dye based ink which remains colored in acid solution consisting of:

an amount of a hydroxide base effective to neutralize the acid of said ink,

an amount of an amine which amine is selected from the group comprising butyl amine, 3-methoxy propylamine, triethylene tetramine, ethanol amine, morpholine, benzyl amine or other aliphatic-like primary amines, effective to act as a decolorizing agent for the dye to form a colorless product, and a hydroxy solvent.

4,228,029

LIQUID CRYSTALLINE COMPOSITIONS

Maged A. Osman, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

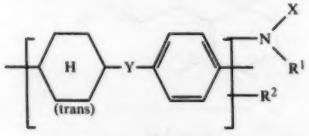
Filed Jan. 24, 1979, Ser. No. 6,101

Claims priority, application Switzerland, Jan. 30, 1978, 983/78

Int. Cl.[2] **G02F** *1/13;* **C09K** *3/34;* **C07C** *69/74, 69/76, 121/46, 121/60*

U.S. Cl. 252—299 **11 Claims**

1. A liquid crystalline composition, especially for liquid crystal displays with a twisted nematic phase, comprising one liquid crystalline or potentially liquid crystalline compound and at least one compound of the formula (1)



(1)

wherein X is a hydrogen atom, a formyl group or a methyl group; R^1 is a C_1–C_{10} alkyl group, R^2 is selected from the group consisting of C_1–C_{10} alkyl radicals, C_1–C_{10} alkoxy radicals, C_2–C_{10} acyloxy radicals, nitrile, nitro, methylsulfonyl and trifluoromethyl; and Y is a single bond between the cyclohexyl and aryl radicals or Y is a carbonyloxy group or a p-phenylene residue.

4,228,030

LIQUID CRYSTAL COMPOSITIONS

Herbert S. Cole, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

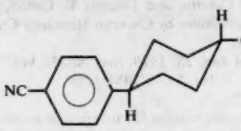
Filed Feb. 28, 1979, Ser. No. 15,771

Int. Cl.[2] **C09K** *3/34;* **G02F** *1/13*

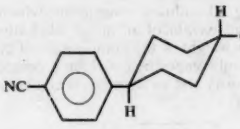
U.S. Cl. 252—299 **4 Claims**

1. A liquid crystal composition with a solid-to-nematic transition temperature of at most 0° C. and a nematic-to-isotropic transition temperature of at least 85° C. consisting of:

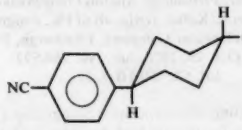
about 85% to about 100%, by weight, of a liquid crystal host composition consisting of about 83% to about 90%, by weight, of a 4-part liquid crystal mixture consisting of about 21% to about 24% by weight of trans-4-n-Propyl-(4-cyanophenyl)-cyclohexane, having a chemical formula



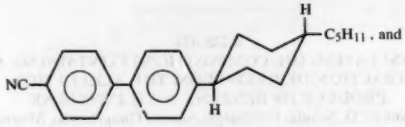
about 32% to about 36%, by weight, of trans-4-n-Pentyl-(4-cyanophenyl)-cyclohexane, having a chemical formula



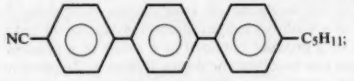
about 22% to about 25%, by weight, of trans-4-n-Heptyl-(4-cyanophenyl)-cyclohexane, having a chemical formula



and about 15% to about 25%, by weight, of trans-4-n-Pentyl-(4′-cyanobiphenyl-4)-cyclohexane, having a chemical formula



about 10% to about 17%, by weight, of 4-n-Pentyl-4″-cyano-p-terphenyl, having the chemical formula



about 0% to about 5%, by weight, of an optically-active material dissolved in said host composition; and;

about 0% to about 10%, by weight, of a dichroic dye dissolved in said host composition.

4,228,031

METHOD OF MAKING IMPERMEABLE MICROCAPSULES

Hiroshi Iwasaki, Kawanishi; Shigeo Okamoto, Amagasaki, and Mitsuru Kondo, Kawanishi, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed May 4, 1978, Ser. No. 902,882

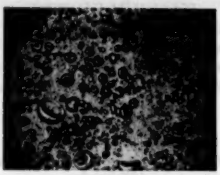
Claims priority, application Japan, May 4, 1977, 52-51488

Int. Cl.[2] **B01J** *13/02*

U.S. Cl. 252—316 **5 Claims**

1. A method for making impermeable microcapsules comprising the steps of preparing coacervates by complex coacervation between a cationic polyamine-epoxy resin and an an-

ionic colloid material, curing by heating to form microcapsules each having a capsule wall of irreversibly hardened and water



insoluble polyamine-epoxy resin, preparing an aqueous dispersion of said microcapsules and adding to said aqueous dispersion an electrolyte to dehydrate said microcapsules.

4,228,032

METHOD OF STORING BLOOD AND A BLOOD STORAGE BAG THEREFORE

Thomas D. Talcott, Santa Barbara, Calif., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 821,668, Aug. 4, 1977, Pat. No. 4,162,676. This application Nov. 6, 1978, Ser. No. 958,306

Int. Cl.[2] A61M *5/00*; A61J *1/00*

U.S. Cl. 252—400 R **5 Claims**

1. A composition useful for prolonging the storage of blood which consists of a cured silicone rubber which has been compounded in its uncured state with $Ca(OH)_2$.

4,228,033

METHOD FOR REACTIVATION OF PLATINUM GROUP METAL CATALYST WITH AQUEOUS ALKALINE AND/OR REDUCING SOLUTIONS

Kiaki Yamauchi; Yukihiko Morimoto; Toshikatu Sasaki, and Katsumi Nakai, all of Osaka, Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Division of Ser. No. 972,868, Dec. 26, 1978, which is a continuation-in-part of Ser. No. 861,521, Dec. 16, 1977, Pat. No. 4,147,660. This application Jul. 18, 1979, Ser. No. 58,436

Claims priority, application Japan, Dec. 22, 1976, 51-155512; Feb. 15, 1977, 52-15635; Apr. 25, 1977, 52-48285; Apr. 25, 1977, 52-48286; Apr. 27, 1977, 52-49507

Int. Cl.[3] B01J *23/96, 21/20*

U.S. Cl. 252—412 **11 Claims**

1. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for partial combustion of hydrocarbons or alkanols with an aqueous solution of an inorganic alkaline compound of alkali metal or alkaline earth metal or mixtures thereof in a concentration of 0.001 to 10 N at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

6. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for partial combustion of hydrocarbons or alkanols with an aqueous solution of a reducing substance in a concentration of 0.01 to 10% by weight at a temperature of 5° to 250° C. until the catalytic activity of the catalyst is substantially recovered.

11. A method for reactivation of a platinum group metal catalyst which comprises contacting a platinum group metal catalyst lowered in the catalytic activity as the result of having been used for partial combustion of hydrocarbons or alkanols with an aqueous solution or a reducing substance in a concentration of 0.01 to 10% by weight at a temperature of 5° to 250° C. for a period of 3 minutes to 80 hours and then treating the catalyst with an aqueous solution of an inorganic alkaline compound of alkali metal or alkaline earth metal or mixtures thereof in a concentration of 0.001 to 10 N at a temperature of 5° to 240° C. until the catalytic activity of the catalyst is substantially recovered.

4,228,034

CATALYTICALLY ACTIVE MASS FOR THE EXCHANGE OF HYDROGEN ISOTOPES BETWEEN STREAMS OF GASEOUS HYDROGEN AND LIQUID WATER

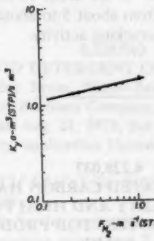
John P. Butler; John H. Rolston; James den Hartog, all of Deep River; Fred W. R. Molson, Petawawa, and John W. Goodale, Deep River, all of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 877,466, Feb. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 733,422, Oct. 18, 1976, abandoned. This application Nov. 13, 1978, Ser. No. 959,712

Claims priority, application Canada, Jun. 25, 1976, 255751

Int. Cl.[2] B01J *31/02*

U.S. Cl. 252—430 **6 Claims**



1. A catalytically active mass for the exchange of hydrogen isotopes between streams of gaseous hydrogen and liquid water, comprising:

(a) a porous matrix of polytetrafluoroethylene, and

(b) exposed, partially platinized high surface area carbon particles dispersed in the porous matrix of polytetrafluoroethylene, and wherein the improvement comprises:

(c) the exposed, partially platinized high surface area carbon particles are dispersed throughout the whole of the porous matrix of polytetrafluoroethylene in the weight ratio 1:1 to 3:1 of polytetrafluoroethylene to partially platinized high surface area carbon particles.

4,228,035

IRRADIATED POLYMER SUPPORTED METAL CATALYST

Harry B. Gray, Pasadena, Calif., and Claude C. Frazier, Memphis, Tenn., assignors to California Institute of Technology, Pasadena, Calif.

Filed May 3, 1976, Ser. No. 682,520

Int. Cl.[3] C08F *31/22*

U.S. Cl. 252—431 R **5 Claims**

1. A method of preparing an olefin addition catalyst comprising the steps of:

forming a solution of a low valent transition metal coordination compound in organic solvent;

irradiating the solution with ultraviolet radiation to form photochemically generated transition metal species;

combining an insoluble organic polymeric support having ligands for said metal with said species; and

attaching said photochemically generated species to said ligands in an amount of at least 0.1% by weight of metal on said polymeric support.

4,228,036

ALUMINA-ALUMINUM PHOSPHATE-SILICA-ZEOLITE CATALYST

Harold E. Swift, Gibsonia; John J. Stanulonis, Pittsburgh, and Elizabeth H. Reynolds, Verona, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 926,886, Jul. 21, 1978, Pat. No. 4,158,621. This application Jun. 18, 1979, Ser. No. 49,358

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—437 8 Claims

1. A catalyst for increasing the gasoline yield and quality in a petroleum cracking reaction under catalytic cracking conditions comprising an alumina-aluminum phosphate-silica matrix characterized after calcination at 500° C. for 16 hours as amorphous, and having an average pore radius of from about 10 Å to about 200 Å; a surface area ranging from about 50 m^2/g to about 300 m^2/g; a pore volume of from about 0.1 cc/g to about 1.2 cc/g; and wherein the alumina-aluminum phosphate-silica matrix has a mole percent ratio of from about 15:80:5 to about 60:10:30 and wherein said matrix retains at least 70% of its surface area when the matrix is additionally calcined at a temperature up to about 900° C. for about 16 hours; said matrix being composited with from about 5 to about 50 weight percent of a zeolite having cracking activity.

4,228,037

SPHERICAL ACTIVATED CARBON HAVING LOW DUSTING PROPERTY AND HIGH PHYSICAL STRENGTH AND PROCESS FOR PRODUCING THE SAME

Kuniaki Hino, Tokyo; Yasuo Uehara, Iruma; Yasushi Nishimura, Ichigayadai; Kazuhiro Watanabe, Ichihara, and Yoshio Okada, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1979, Ser. No. 6,495

Claims priority, application Japan, Feb. 6, 1978, 53/12139

Int. Cl.[2] C01B *31/08, 31/10;* B01J *21/18*

U.S. Cl. 252—444 11 Claims

1. A process for producing spherical particles of activated carbon having a low susceptibility to dusting, comprising the steps of:

heating while continuously stirring a mixture of a pitch having a softening point of 50° to 350° C., a carbon content of 80 to 97%, an atomic ratio of hydrogen to carbon of 0.3 to 2.0, and a content of nitrobenzene insoluble matter of below 60%, at least one aromatic compound miscible with said pitch and 0.1 to 10% by weight based on the amount of said pitch of at least one polymer or one copolymer having the chain hydrocarbon moiety as a major component thereof, thereby liquefying homogeneously said mixture;

dispersing said liquefied mixture into an aqueous solution containing a suspending agent, thereby obtaining microspheres of said mixture dispersed in said solution; and

subjecting the thus obtained microspheres to a series of treatments of removal of said aromatic compound, infusibilization, carbonization and activation.

9. The spherical particles of activated carbon produced by the process of claim 1, having the following properties:

0.1 to 1.5 mm in diameter;

0.5 to 1.5 g/ml of density of individual particles;

800 to 1600 m^2/g of specific surface area;

about 0.3 ml/g, as measured in the range of micropore radius of below 100 Å, of micropore volume and also 0.5 ml/g, as measured in the range of micropore radius between 100 and 100,000 Å; and

below 0.5% by weight of ash content.

4,228,038

METHOD FOR THE PREPARATION OF CATALYST OF VANADIUM PENTOXIDE ON SUBSTRATE OF TITANIUM DIOXIDE

Peter König, Budapest, Hungary, assignor to Tioxide Group Limited, Billingham, England

Filed Sep. 14, 1979, Ser. No. 75,410

Claims priority, application United Kingdom, Jul. 24, 1979, 25801/79

Int. Cl.[3] B01J *21/06, 23/22*

U.S. Cl. 252—461 10 Claims

1. A method for the manufacture of a selective oxidation catalyst which comprises the following process stages:

(1) heating a particulate catalyst substrate comprising titanium dioxide in an atmosphere containing water vapour

(2) treating the substrate with vanadium oxytrichloride in vapour form

(3) heating the treated substrate until the evolution of hydrogen chloride has ceased and to complete the conversion of the deposited vanadium compound to vanadium pentoxide

(4) repeating the process stages 1, 2, and 3 at least a further three times, and

(5) finally allowing the treated substrate comprising the selective oxidation catalyst to cool.

4,228,039

CATALYTIC COMPOSITION USED IN PURIFYING GASEOUS EFFLUENTS POLLUTED BY NITROGEN OXIDES AND PROCESS FOR PREPARING THE COMPOSITION

Michel Senes, La Baule; Yannick Le Goff; Jean F. Gourdier, both of Saint Nazaire, and Jacques Quibel, Maisons Laffitte, all of France, assignors to Societe Chimique de la Grand e Paroisse, Paris, France

Filed Dec. 27, 1978, Ser. No. 973,626

Claims priority, application France, Dec. 28, 1977, 77 39422

Int. Cl.[3] B01J *21/04, 23/10, 23/84, 23/86*

U.S. Cl. 252—462 15 Claims

1. A catalytic composition obtained by coprecipitation, used in purification of gaseous effluents polluted by nitrogen oxides, comprising as active elements, iron and chrominum in oxide form associated with alumina and, optionally, a promoter selected from the rare earth oxides, taken separately or in combination, and crude platinum metals, in which the content or rare earth oxides, when present, is between 0.1 and 1% by weight in relation to the active material; wherein the specific surface of said composition is between 50 and 300 m^2/g and the dimensions of the pores between 40 and 50,000 Å.

4,228,040

LITHIUM- OR MAGNESIUM-PROMOTED ZINC TITANATE CATALYST FOR DEHYDROGENATION OF HYDROCARBONS

Brent J. Bertus, and Darrell W. Walker, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 844,931, Oct. 27, 1977, Pat. No. 4,176,140, which is a continuation-in-part of Ser. No. 743,193, Nov. 19, 1976, abandoned. This application Jun. 13, 1979, Ser. No. 48,103

Int. Cl.[2] B01J *21/06, 21/10, 23/04, 23/06*

U.S. Cl. 252—475 7 Claims

1. A catalyst composition consisting essentially of zinc, titanium, a metal selected from the group consisting of lithium

and magnesium, and sufficient oxygen to satisfy the valence requirements of said zinc, said titanium and said lithium or magnesium prepared by intimately mixing zinc oxide, titanium dioxide, and a compound of said metal and thereafter calcining the resulting mixture in air at a temperature in the range of 650° to 1050° C.

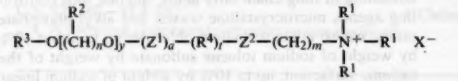
4,228,041
Patent Not Issued For This Number

4,228,042
BIODEGRADABLE CATIONIC SURFACE-ACTIVE AGENTS CONTAINING ESTER OR AMIDE AND POLYALKOXY GROUP

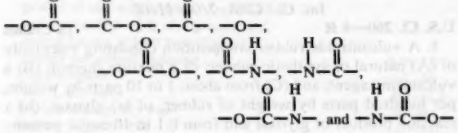
James C. Letton, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 811,219, Jun. 29, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,343
Int. Cl.² C11D *1/62, 1/835;* **C07C** *101/18*
U.S. Cl. 252—528 **50 Claims**

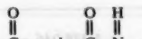
1. A compound having the formula



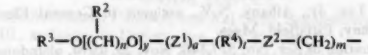
wherein each R^1 is C_1 to C_4 alkyl or hydroxyalkyl; each R^2 is either hydrogen or C_1 to C_3 alkyl; R^3 is C_4 to C_{30} straight or branched chain alkyl or alkenyl; R^4 is C_1 to C_{10} alkylene or alkenylene; n is from 2 to 4; y is from 1 to 20; a is 0 or 1, and t is 0 to 1, but t must be 1 when a is 1; m is from 1 to 5; Z^2 is selected from the group consisting of



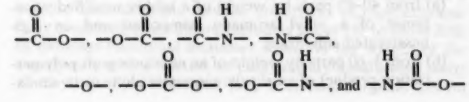
Z^1 is selected from the group consisting of



said selections being made so that



is an alkyl or alkenyl group which can be interrupted by only structures selected from the group consisting of:



and wherein at least one of said Z^1 or Z^2 groups is selected from the group consisting of ester, reverse ester, amide, and reverse amide; and X is an anion which makes the surfactant at least water-dispersible.

26. A detergent composition containing from 0 to about 20% of phosphate materials, and having a pH in the laundry solution of not greater than about 11, comprising from about 5 to about 100% of a surfactant mixture consisting essentially of

(a) a biodegradable nonionic surfactant having the formula $R(OC_2H_4)_nOH$ wherein R is a primary or secondary alkyl chain of from about 8 to about 22 carbon atoms and n is an average of from about 2 to about 12, having an HLB of from about 5 to about 17; and

(b) the cationic surfactant of claim **1**; said composition having a pH of at least about 6.5 in the aqueous laundry solution, and wherein the ratio of said nonionic to said cationic component is in the range of from about 1:1 to about 100:1.

4,228,043
LIQUID DETERGENT COMPOSITION

Guido C. van den Brom, Nieuw-Beijerland, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 934,739
Claims priority, application United Kingdom, Aug. 22, 1977, 35089/77
Int. Cl.² C11D *3/06, 3/30, 11/04, 17/08*
U.S. Cl. 252—529 **2 Claims**

1. In a process for the preparation of an aqueous built liquid detergent composition containing 2 to 20% by weight of an active detergent, at least about 12% by weight of sodium tripolyphosphate, at least 2% by weight of an alkalimetal orthophosphate in which the alkali metal orthophosphate is produced in situ by neutralizing orthophosphoric acid by a suitable base, the sum of the two phosphate builders being about 14% to about 35% by weight, and a hydrotrope or stabilizing system, the improvement which comprises the step of adding from 0.5% to 5% by weight of a mono-, di- or trialkanolamine, wherein the alkanol constituent is ethanol, propanol or isopropanol.

4,228,044
LAUNDRY DETERGENT COMPOSITIONS HAVING ENHANCED PARTICULATE SOIL REMOVAL AND ANTIREDEPOSITION PERFORMANCE

Cushman M. Cambre, Blue Ash, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

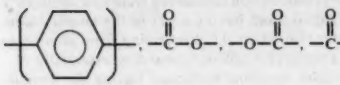
Continuation-in-part of Ser. No. 811,419, Jun. 29, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,340
Int. Cl.² C11D *1/38, 3/26, 7/32*
U.S. Cl. 252—547 **32 Claims**

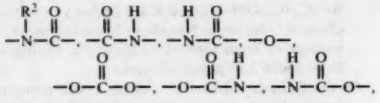
1. A detergent composition, which contains from 0 to about 20% phosphate materials, consisting essentially of from about 5% to about 100% of a surfactant mixture consisting essentially of

(a) a biodegradable nonionic surfactant having the formula $R(OC_2H_4)_nOH$ wherein R is a primary or secondary alkyl chain of from about 8 to about 22 carbon atoms and n is an average of from about 2 to about 12, having an HLB of from about 5 to about 17;

(b) a cationic surfactant having the formula $R_m{}^1R_x{}^2Y_LZ$ wherein each R^1 is an organic group containing a straight or branched alkyl or alkenyl group optionally substituted with up to three phenyl or hydroxy groups and optionally

interrupted by up to four structures selected from the group consisting of

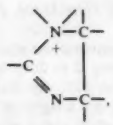




and mixtures thereof, each R^1 containing from about 8 to 22 carbon atoms, and which may additionally contain up to about 12 ethylene oxide groups, m is a number from 1 to 3, each R^2 is an alkyl or hydroxyalkyl group containing from 1 to 4 carbon atoms or a benzyl group with no more than one R^2 in a molecule being benzyl, x is a number from 0 to 11, the remainder of any carbon atom positions being filled by hydrogens, Y is selected from the group consisting of:

(1)

(2)



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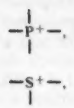
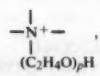
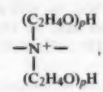
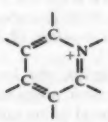




wherein p is from 1 to 12,



wherein p is from 1 to 12,



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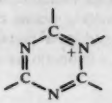
(8)



and

(9) mixtures thereof;

L is 1 or 2, the Y groups being separated by a moiety selected from the group consisting of R^1 and R^2 analogs having from 1 to about 22 carbon atoms and two free carbon single bonds, where L is 2; Z is an anion in a number to give electrical neutrality, and said cationic surfactant being at least water-dispersible in admixture with said nonionic surfactant; and

(c) a fatty amide surfactant; said composition having a pH of at least about 6.5 in the aqueous laundry solution, the ratio of said nonionic to said cationic surfactant being in the range of from about 1:1 to about 100:1, and the ratio of the combined nonionic and cationic surfactants to said amide surfactant being in the range of from about 5:1 to about 50:1 and the balance being selected from the group consisting of: up to about 15% of an electrolyte selected from the group consisting of perborates, phosphates, polyphosphonates, carbonates, and sulfates; sources of alkalinity selected from the group consisting of sodium hydroxide, triethanolamine, monoethanolamine and sodium silicate; up to 15% of a suds suppressor selected from the group consisting of long chain fatty acids, silicone suds controlling agents, microcrystalline waxes, and alkyl phosphate esters; water; ethanol; sodium chloride; up to about 40% by weight of sodium toluene sulfonate by weight of the cationic surfactant; up to 10% by weight of sodium linear alkyl benzene sulfonate by weight of the cationic surfactant; and mixtures thereof.

4,228,045

METHOD OF ADHESION OF RUBBER TO REINFORCING MATERIALS

(4) **Rao S. Bezwada, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

Filed Jan. 31, 1979, Ser. No. 8,204

Int. Cl.[2] **C08L** *7/00, 11/00*

U.S. Cl. 260—4 R **18 Claims**

(5) **1**. A vulcanizable rubber composition consisting essentially of (A) natural or synthetic rubber, or a mixture thereof; (B) a vulcanizing agent; and (C) from about 1 to 10 parts by weight, per hundred parts by weight of rubber, of (a) glyoxal, (b) a reaction product of glyoxal and from 0.1 to 10 molar proportions of urea or (c) a reaction product of glyoxal, 0.1 to 10 molar proportions of urea and from 0.01 to 2 molar proportions of formaldehyde per molar proportion of glyoxal.

4,228,046

(6) ## THERMOPLASTIC MOLDING COMPOSITIONS OF RUBBER MODIFIED COPOLYMERS OF A VINYL AROMATIC COMPOUND AND AN α,β-UNSATURATED CYCLIC ANHYDRIDE

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 527,140, Nov. 25, 1974, abandoned. This application Jul. 25, 1979, Ser. No. 60,608

Int. Cl.[3] **C08K** *7/14;* **C08L** *51/04, 71/04*

(7) **U.S. Cl. 260—5** **11 Claims**

1. A thermoplastic molding composition which comprises:

(a) from 40–95 parts by weight of a rubber modified copolymer of a vinyl aromatic compound and an α,β-unsaturated anhydride;

(b) from 5–60 parts by weight of an emulsion graft polymerization product of an acrylic monomer alone or in admix-

ture with a styrene monomer on a rubbery diene homopolymer or styrene-diene copolymer backbone; and
(c) from 5–50 parts by weight of a polyphenylene ether resin.

4,228,047
STARCH COMPATIBLE POLYVINYL ACETATE LATICES

Wallace H. Pippin, Branchburg, N.J., and Wiley E. Daniels, Easton, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 31, 1978, Ser. No. 956,313
Int. Cl.[3] C08L *3/02*
U.S. Cl. 260—17.4 ST **17 Claims**

1. A coating composition comprising a latex which contains a copolymer of vinyl acetate in the range of about 95 to 99.9% by weight and maleic anhydride in the range of about 5.0 to 0.1% by weight polymerized in an aqueous medium in the presence of a surfactant which prevents the resulting vinyl acetate-maleic anhydride copolymer from becoming solubilized in said aqueous medium and a free radical initiator, said latex being characterized by having a solids content of at least 50% by weight and a copolymer particle size of not more than 0.5 micron.

4,228,048
FOAM CLEANER FOR FOOD PLANTS

Thomas C. Tesdahl, Cincinnati, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio

Filed May 25, 1979, Ser. No. 42,657
Int. Cl.[3] C08L *5/00*
U.S. Cl. 260—17.4 UC **4 Claims**

1. A cleaning concentrate consisting essentially of:

Components	Wt. %
Water	8.5–97.45
water dispersible cross-linked interpolymer of a monomeric mixture comprising a monomeric polymerizable alpha-beta monoolefinically unsaturated lower aliphatic carboxylic acid, and a polyether of a polyol selected from the class consisting of oligo saccharides, reduced derivatives thereof in which the carbonyl group is converted to an alcohol group, and pentaerythritol, the hydroxyl groups of said polyol which are modified being etherified with allyl groups, said polyol having at least two allyl ether groups per polyol molecule	0.05–2.0
Polyphosphate	2.–16
NaOH, dry basis	0.1–12.5
Sodium silicate, dry basis	0.1–9
Sodium hypochlorite	.05–5.0
C_{13-18} alkane sulfonate, dry basis	.03–9
Sodium polyacrylate, dry basis	0–2

4,228,049
AQUEOUS COATINGS BASED ON COPOLYMERS WITH A MIXTURE OF UNSATURATED ESTERS OF POLYMERIC POLYOL AND BISPHENOL-ETHYLENE OXIDE ADDUCT

Kazys Sekmakas, Palatine, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 13, 1978, Ser. No. 960,310
Int. Cl.[2] C09D *3/52, 3/58*
U.S. Cl. 260—21 **8 Claims**

1. A low temperature-curing aqueous coating composition comprising water having dispersed therein with the aid of a volatile base, an acidic solution copolymer of monoethylenically unsaturated monomers, including about 2% to about 20% of carboxyl-functional monomer based on the weight of the copolymer, with a mixture of ethylenically unsaturated esters of ethylenically unsaturated fatty acids with organic solvent soluble and water insoluble polymeric polyol and water soluble bisphenol-ethylene oxide adduct polyol, there being a total of more than two moles of unsaturated fatty acid per mol of said polymeric polyol, and said bisphenol-ethylene oxide polyol constituting from 10% to 125% of the weight of said polymeric polyol.

4,228,050
CONDUCTIVE MOLDING COMPOSITION

Carl J. Martin; Marvin J. Voelker, both of Indianapolis, and Robert J. Ryan, Zionsville, all of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,363
Int. Cl.[3] C08L *91/00*; H04N *5/76, 5/82*
U.S. Cl. 260—23 XA **9 Claims**

1. A conductive molding composition comprising
sufficient finely divided conductive carbon black particles so that the composition has a bulk resistivity below 500 ohm-cm at 900 megahertz,
from about 1.5 to 4 percent by weight of stabilizers for polyvinylchloride resins:
from about 1 to 3 percent by weight of at least two lubricants for polyvinylchloride resins;
up to 10 percent by weight of plasticizers and processing aids for polyvinylchloride resins, and the remainder a polyvinylchloride-based resin, having a T_g of at least 60° C., with the proviso that not more than about 5 percent by weight of liquid additives that are compatible with the polyvinylchloride resin are present and wherein the carbon black, stabilizers, lubricants, plasticizer and processing aids are uniformly dispersed with the resin.

4,228,051
THERMOPLASTIC RESIN COMPOSITION HAVING GOOD HEAT CYCLE PROPERTY

Hajime Sakano, Osaka; Mikio Kodama, Nagisasakae; Toshihiro Shoji, and Isao Yoshida, both of Amagasaki, all of Japan, assignors to Sumitomo Naugatuck Co., Ltd., Japan

Filed Jul. 31, 1979, Ser. No. 62,584
Int. Cl.[2] C08L *83/04, 91/00*
U.S. Cl. 260—23.7 R **6 Claims**

1. A thermoplastic resin composition which comprises (A) a graft polymer comprising a conjugated diene rubber and an aromatic vinyl compound and a vinylic cyanide grafted thereon in a weight proportion of 5–80:15–140, the weight ratio of the aromatic vinyl compound and the vinylic cyanide being 10–90:5–50, (B) a copolymer comprising an aromatic vinyl compound and a vinylic cyanide in a weight ratio of 40:60 to 90:10 and (C) an organosilicon compound, the weight proportion of the graft polymer (A) and the copolymer (B) being from 5:95 to 95:5 and the amount of the organo-silicon compound (C) being from 0.05 to 3.0 parts by weight to 100 parts by weight of the combined amount of the graft polymer (A) and the copolymer (B).

4,228,052
METHOD OF MIXING MATERIALS OF CONSTRUCTION WITH MINOR AMOUNTS OF ADDITION AGENTS

Paul Haberl, Klein Wolkersdorf 129, Austria

Filed Feb. 27, 1978, Ser. No. 881,559
Int. Cl.[2] C08L *95/00*
U.S. Cl. 260—28.5 AS **2 Claims**

1. A method of adding a measured amount of at least one addition agent to a basic component which comprises:
(a) mechanically comminuting a plurality of unitary bodies of a polyolefin until each of said bodies is converted to a multiplicity of particles and said particles are heated by said comminuting to a temperature at which the surfaces of said particles are tacky;
(b) contacting the tacky surfaces of said particles with said

amount of said at least one addition agent and thereby securing said at least one addition agent to said surfaces as a surface coating,

(1) said amount being smaller than than the weight of said particles;

(c) cooling the coated particles below said temperature; and

(d) thereafter, substantially uniformly dispersing the coated particles in said basic component; wherein said at least one addition agent includes an elastomer dispersed as a latex in an aqueous medium, a portion of the water in said latex being retained in the coated particles, and the remainder of said water being evaporated from the coated particles prior to said dispersing.

4,228,053

CONCRETE PREPARATION WITH AQUEOUS SOLUTION OF PRODUCT FROM POLYETHER WITH POLYMETHYLENE POLYPHENYL POLYISOCYANATE

Alexander McLaughlin, Meriden; Reinhard H. Richter, North Haven, both of Conn., and Harold E. Reymore, Jr., Richmond, Va., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 849,859, Nov. 9, 1977, Pat. No. 4,143,014. This application Jan. 29, 1979, Ser. No. 7,588

Int. Cl.³ C08L *75/08*

U.S. Cl. 260—29.2 TN **10 Claims**

1. An improved process for the preparation of concrete wherein the improvement comprises incorporating into the concrete-forming mixture from about 0.1 parts to about 10 parts by weight, based on the solids content thereof, per 100 parts by weight of concrete-forming mixture, of an aqueous solution which comprises the product obtained by admixing at a temperature in the range of 25° C. to 100° C. (i) a polyether glycol selected from the group consisting of polyethylene glycols having a molecular weight from 600 to 3000 and polypropylene glycols capped with from 15 to 85 percent by weight of ethylene oxide and having a molecular weight from 1000 to 3500, with (ii) a mixture of polymethylene polyphenyl polyisocyanates containing from 25 to 90 percent by weight of methylenebis(phenyl isocyanates) the remainder of said mixture being polymethylene polyphenyl polyisocyanates of functionality higher than 2.0, the proportions of (i) and (ii) being such that there are from 0.1 to 0.99 equivalents of polyol per equivalent of polyisocyanate, and, during the time when the product so obtained is completely soluble in water, admixing said product with water in a proportion of from 1 to 20 parts by weight of said product per 100 parts by weight of water to form a clear aqueous solution.

4,228,054

ORGANOPOLYSILOXANE LATEX COMPOSITIONS

Isao Ona, Sodegauramachi; Masaru Ozaki, and Katsutoshi Usui, both of Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 12,995

Claims priority, application Japan, Apr. 5, 1978, 53/39119

Int. Cl.² C08L *83/06*

U.S. Cl. 260—29.2 M **8 Claims**

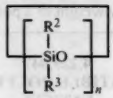
1. A composition of matter which is a mixture of an organopolysiloxane obtained by polymerizing a cyclic organopolysiloxane in the presence of

(A) an organofunctionaltrialkoxysilane;

(B) a surfactant and,

(C) water,

wherein the cyclic organopolysiloxane before polymerization has the general formula



wherein R^2 and R^3 are independently selected from substituted or unsubstituted monovalent hydrocarbon radicals containing 1–10 carbon atoms and n has an average value of 3–6;

the organofunctionaltrialkoxysilane has the general formula

$$(R'O)_3SiRX$$

wherein R′ is a monovalent hydrocarbon radical containing less than 7 carbon atoms or is selected from the group consisting of $—CH_2OC_2H_5$ or $—CH_2CH_2OCH_3$, R is a divalent hydrocarbon radical containing no more than 12 carbon atoms, X is an organofunctional radical selected from the group consisting of $—NH_2$, $—CH_2CH_2NH_2$, $—(CH_2)_4NH_2$, N-cyclohexylamino, N-phenylamino, N-aminoethylamine, N,N-dimethylamino, glycidyl, 3,4-epoxycyclohexyl, mercapto or methacrylo.

4,228,055

AQUEOUS COATING COMPOSITIONS CONTAINING FLATTING AGENTS AND LOW MOLECULAR WEIGHT POLYETHERS

David R. Wallace, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 6, 1978, Ser. No. 940,045

Int. Cl.² C08L *61/10, 61/28*

U.S. Cl. 260—29.3 **13 Claims**

1. An aqueous coating composition useful for imparting to metal coil a low gloss pigmented protective finish having good metal marking resistance, said composition consisting essentially of:

(a) from about 10 percent to about 50 percent of a water-insoluble film-forming acrylic resin, vinyl resin or mixture thereof;

(b) from about 0.5 percent to about 7 percent of flatting agent, said agent being water-insoluble agglomerated particulate beads having a gross particle diameter of from about 1 micron to about 60 microns, wherein said beads consist essentially of the reaction product of urea, melamine or phenol and formaldehyde having a molar ratio of the urea to the formaldehyde of from about 1:1 to about 6:1, a molar ratio of the melamine to the formaldehyde of from about 1:1 to about 1:4, and a molar ratio of the phenol to the formaldehyde of from about 1:1 to about 1:3;

(c) from about 0.5 percent to about 7 percent of polyether having the formula $H(OC_xH_{2x})_nOH$, wherein x is from 2 to 4 and n is a number such that the polyether has a weight average molecular weight of from about 300 to about 700;

(d) from about 5 percent to about 40 percent of pigment; and

(e) the balance water.

4,228,056

SHAPED ARTICLES FROM INSOLUBLE HYDROGELS AND METHOD OF MANUFACTURING SAME

Artur Stoy, Prague, Czechoslovakia, assignor to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 526,718, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 319,309, Dec. 29, 1972, abandoned, which is a continuation of Ser. No. 43,926, Jun. 5, 1970, abandoned. This application May 30, 1978, Ser. No. 910,449

Claims priority, application Czechoslovakia, Jun. 13, 1969, 4200-69

Int. Cl.[2] **B29C** *3/00;* **C08L** *35/04*

U.S. Cl. 260—29.6 AN **8 Claims**

1. A method of manufacturing shaped articles from insoluble crosslinked hydrogels by polymerization-casting is a closed or open mold an initiated solution of about 20 to about 40% by weight of monomeric material consisting predominantly of acrylonitrile in absence of added crosslinking agent in an aqueous solution containing zinc chloride as the main component thereof, partially hydrolyzing the thus obtained insoluble crosslinked gel consisting of polyacrylonitrile or of acrylonitrile copolymer with up to 15% (mol) or other monomers copolymerizable with acrylonitrile in the presence of an acidic medium, said insoluble crosslinked gel being plasticized with said salt solution, and removing salts from the thus obtained partially hydrolyzed castings by treating them with a dilute aqueous solution of an electrolyte the anion of which forms a precipitate of the corresponding water-insoluble zinc compound in the solution surrounding said gel, until substantially all of the zinc ions have been removed from said gel, thereby forming a water-swelled crosslinked hydrogel shaped article.

8. A chemically and physically stable, insoluble but water-swellable crosslinked hydrogel shaped article produced by the process of claim 1.

4,228,057

GROUTING COMPOSITION CONTAINING ACRYLATE SALTS OF IRON

Kenneth G. Phillips, River Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 12, 1979, Ser. No. 19,998

Int. Cl.[3] **C08F** *230/04, 4/30, 30/04, 222/02*

U.S. Cl. 260—29.6 TA **1 Claim**

1. An aqueous solution of

(a) acrylic acid;

(b) an iron acrylate from the group consisting of ferrous or ferric acrylates;

(c) methylene bis acrylamide; and

(d) a water-soluble polymerization catalyst which also is a reducing agent when the iron acrylate is ferric acrylate and an oxidizing agent when the iron acrylate is ferrous acrylate;

with the ratio of (a) to (b) being between 10:0.1 to 10:1.5, which solution forms a water-resistant gel.

4,228,058

FLAME RETARDANT LATEXES

Ramchandra K. Hulyalkar, Oakland, N.J., and Rodrigue V. Lauzon, Seabrook, Tex., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 840,945, Oct. 11, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,377

Int. Cl.[2] **C09D** *3/74, 3/76, 5/02, 5/18*

U.S. Cl. 260—29.7 UA **20 Claims**

1. A flame retardant latex base consisting essentially of a blend of two separately polymerized aqueous latexes each of which has a polymer content of at least about 35% by weight which in the first latex is a copolymer of which about 70 to 92% by weight is derived from vinylidene chloride with the balance being polar monomers which are predominantly lower alkyl esters of acrylic acids and in the second latex is a copolymer derived primarily from butadiene and styrene in weight proportions of between about 1 part butadiene to 9 parts styrene and about 2 parts butadiene to 1 part styrene, the proportion of said first latex comprising at least about 20% but not over about 90% by weight of said blend and sufficient to provide a vinylidene chloride content equivalent to between about 20 and 80% by weight of the total polymer content in said blend.

4,228,059

WIRE ENAMEL

Klaus Ohm, Nettetal, Fed. Rep. of Germany, assignor to Chemische Fabrik Dr. Wiedeking, Kempen, Fed. Rep. of Germany

Continuation of Ser. No. 851,831, Nov. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 686,909, May 17, 1976, abandoned. This application Jun. 27, 1979, Ser. No. 52,583

Claims priority, application Fed. Rep. of Germany, May 21, 1975, 2522386; Sep. 19, 1975, 2541819

Int. Cl.[2] **C08K** *5/06, 5/07, 5/10, 5/17*

U.S. Cl. 260—30.2 **9 Claims**

1. In a wire enamel consisting essentially of a polyesterpolyimide resin and a solvent system containing said resin as a solute, the resin having a hydroxyl value of 150 to 600, and at least 20% by weight of the alcohol component of said resin consisting of tris-(2-hydroxyethyl) isocyanurate, the improvement in the solvent system which comprises:

(a) 30% to 100% of the weight of said solvent system consisting of at least one member of the group consisting of diacetone alcohol, monoalkyl ethers of the formula C_nH_{2n+1}—(O—CH_2—CH_2)$_m$—OH, and alkanoic acid esters of said ethers,

(1) in said formula, n and m being integers, n being 1 to 4, and m being 1 or 2, and

(2) said alkanoic acid having a carbon chain of not more than four members; and

(b) the remainder of said solvent system essentially consisting of compounds free from phenolic hydroxyl groups when said at least one member is less than 100%.

4,228,060

POLYMERIZATION OF ACETYLENE

Guido Pez, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 3, 1978, Ser. No. 957,276

Int. Cl.[2] **C08F** *4/76, 38/02;* **C08K** *5/01, 5/15*

U.S. Cl. 260—30.4 R **7 Claims**

1. A process for producing polyacetylene gel compositions comprising contacting acetylene with a mixture comprised of μ-(η^1:η^5-cyclopentadienyl) tris(η-cyclopentadienyl)-dititanium (Ti-Ti) catalyst, or nitrogen adduct complexes thereof, in an inert organic solvent therefor, at a temperature of about −120° to +200° C., under a pressure of about 0.0001 to 50 atmospheres, substantially in the absence of elemental oxygen and water, said contacting being conducted in a quiescent state thereby resulting in the polyacetylene gel composition.

2. A composition comprising a polymeric gel consisting essentially of a polyacetylene and a gel-forming liquid therefor, being an inert organic solvent, and selected from C_6–C_{14} aromatic hydrocarbons, C_5–C_{18} linear or branched acyclic or cyclic saturated aliphatic hydrocarbons, C_4–C_6 saturated aliphatic cyclic mono- or diethers, C_7–C_{10} aromatic mono- or diethers, C_2–C_6 linear or branched saturated aliphatic acylic mono- or diethers, C_3–C_8 linear or branched saturated aliphatic tertaryamines, C_5–C_8 cyclic mono- olefins, C_4–C_{12} linear or branched alpha olefins, and mixtures thereof; said composition containing up to a maximum of about 10 weight percent of catalyst per weight of polyacetylene, said catalyst being μ-(η^1:η^5-cyclopentadienyl)-tris(η-cyclopentadienyl) dititanium (Ti-Ti); said gel being stable to phase separation at about 25° C., in a closed system.

4,228,061

METHOD OF PRODUCING IMPROVED VINYL CHLORIDE PLASTISOL COATING COMPOSITIONS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Oct. 2, 1978, Ser. No. 947,324
Int. Cl.[3] C08K 5/05, 5/09, 5/10, 5/16
U.S. Cl. 260—31.2 R 6 Claims

1. A method of producing a resinous vinyl chloride polymer based coating composition having improved adhesion to substrates, comprising combining

(A) a dispersion of resinous vinyl chloride polymer, containing at least 75 mole percent vinyl chloride monomer units, in plasticizer and

(B) a product of hydrolysis of an aminofunctional organotrialkoxysilane with at least 0.5 moles of water per mole of the silane which product is devolatilized of essentially all substances boiling below 150° C. at atmospheric pressure,

to form a mixture consisting essentially of (A) and (B), the mixture containing 0.1 to 2 percent by weight of (B) based on the combined weights of (A) and (B), the aminofunctional organotrialkoxysilane having the general formula

$$(RO)_3SiCH_2CH_2CH_2NH(CH_2CH_2NH)_xH$$

wherein

R is a monovalent alkyl radical of from 1 to 3 inclusive carbon atoms, and

x is zero or 1.

4,228,062

RAPID SETTING HIGH BOND STRENGTH ADHESIVE

Henry L. Lee, Jr., Pasadena, and Jan A. Orlowski, Altadena, both of Calif., assignors to Lee Pharmaceuticals, South El Monte, Calif.

Continuation of Ser. No. 714,841, Aug. 16, 1976, abandoned, which is a continuation of Ser. No. 386,416, Aug. 7, 1973, abandoned. This application May 2, 1978, Ser. No. 902,091
Int. Cl.[2] C08K 3/36
U.S. Cl. 260—42.28 8 Claims

1. A rapid setting adhesive exhibiting high bond strength toward at least stainless steel, polycarbonate type plastics, and tooth enamel containing about 50 parts by weight glycidyl methacrylate, about 50 parts by weight of a finely divided cured polymethylmethacrylate, about 50 parts by weight of a finely divided polyethylmethacrylate, about 100 parts by weight of a finely divided copolymer of approximately equal amounts by weight of methylmethacrylate and ethylmethacrylate, about 50 parts by weight of diethylene glycol dimethacrylate crosslinking agent, less than about 5 percent of a conventional peroxide polymerization catalyst based on the combined weight of the glycidyl methacrylate and the finely divided fillers, and a minor amount of a conventional accelerator.

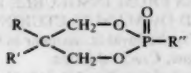
4,228,063

FLAME-RETARDANT, POLYPHENYLENE-ETHER RESIN COMPOSITIONS CONTAINING A 2,5,5-TRISUBSTITUTED 1,3,2-DIOXAPHOSPHORINANE-2-OXIDE

Albrecht H. Granzow, Somerset, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 25, 1979, Ser. No. 42,490
Int. Cl.[2] C08K 5/52; C08L 71/04
U.S. Cl. 260—45.7 P 10 Claims

1. A flame-retardant, polyphenylene-ether resin/rubber-modified, high-impact polystyrene thermoplastic composition comprising an effective flame-retarding amount of a 2,5,5-trisubstituted-1,3,2-dioxaphosphorinane-2-oxide compound represented by the formula:



(I)

wherein R and R′ are methyl or ethyl, and R″ is selected from alkyl of 1–4 carbon atoms, phenyl, phenyl having 1–3 methyl groups, benzyl, and benzyl having 1–3 methyl groups.

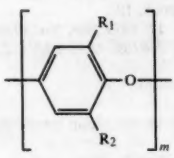
4,228,064

FLAME-RETARDANT POLYPHENYLENE ETHER RESIN COMPOSITION

Shinichi Izawa, Tokyo; Jun Sugiyama, Yokohama, and Atsuo Nakanishi, Kanagawa, all of Japan, assignors to Asaki-Dow Limited, Tokyo, Japan

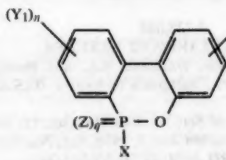
Division of Ser. No. 837,629, Sep. 27, 1977, Pat. No. 4,198,492. This application Oct. 18, 1979, Ser. No. 86,145
Claims priority, application Japan, Oct. 4, 1976, 51-118482
Int. Cl.[3] C08K 5/52, 5/53
U.S. Cl. 260—45.7 P 17 Claims

1. A flame-retardant polyphenylene ether resin composition comprising (A) 85 to 97% by weight of a resin consisting of (1) 20 to 90% by weight of a polyphenylene ether of the generic formula (A):



(A),

where R_1 and R_2 are each an alkyl of 1 to 4 carbon atoms and m is the degree of polymerization, and (2) 10 to 80% by weight of a styrene type polymer, and (B) 3 to 15% by weight of at least one member selected from the group consisting of phosphorus-containing compounds of the generic formula (B):



(B),

where X is a hydrogen atom, a hydroxyl, an amino, a halogen, an alkyl of 1 to 10 carbon atoms, an alkoxy of 1 to 10 carbon atoms, an alkylthio of 1 to 10 carbon atoms, an aryloxy of 6 to 10 carbon atoms or a hydroxyl-substituted aryloxy of 6 to 10 carbon atoms, Y_1 and Y_2 are each an alkyl of 1 to 8 carbon atoms, an alkoxy of 1 to 8 carbon atoms or an aryl group, Z is an oxygen or sulfur atom, n and p are each an integer of 0 to 4 and q is an integer of 0 or 1.

4,228,065

MICROBIOCIDAL ORGANOPOLYSILOXANE MOLDING COMPOSITIONS

Hermann Genth; Wilfried Paulus; Paul Schiller, all of Krefeld; Hans Sattlegger, Odenthal, and Karl Schnurrbusch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

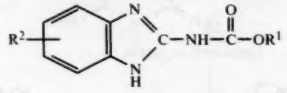
Filed Aug. 4, 1978, Ser. No. 931,045

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737405

Int. Cl.[2] C08K *5/34*

U.S. Cl. 260—45.8 N 9 Claims

1. An organopolysiloxane composition having a microbicidal action comprising an α,ω-dihydroxypolydiorganosiloxane,N-(fluorodichloromethylthio)-phthalimide and a benzimidazolyl-alkyl-carbamate of the formula



wherein

R^1 is an alkyl radical with 1 to 4 carbon atoms, optionally substituted by the radical $—OR^3$,

R^3 is an alkyl radical with 1 to 4 carbon atoms or the phenyl radical, and

R^2 is hydrogen, an alkyl radical with 1 to 4 carbon atoms, halogen or nitro.

4,228,066

STABILIZED POLYMER COMPOSITIONS

Burnett H. Johnson, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 12, 1979, Ser. No. 29,597

Int. Cl.[2] C08K *5/42, 5/13;* C07F *15/00*

U.S. Cl. 260—45.75 C 16 Claims

1. Copper chelates of 2-hydroxy-4-methoxy-5-sulfobenzophenone and 2-hydroxy-4-methoxy-2'-carboxybenzophenone.

2. A stabilized polymer composition comprising polymers selected from the group consisting of polyparabanic acid, poly(iminoimidazolidinediones, polyurethanes, polyureas, polyesters, polyamides, polyimides, polycarbonates, polyhydantoins and polymers containing one or more moieties characteristic of these polymers and a stabilizing amount of a copper chelate of 2-hydroxy-4-methoxy-5-sulfobenzophenone or 2-hydroxy-4-methoxy-2'-carboxybenzophenone.

4,228,067

UV LIGHT STABILIZED POLYCARBONATE COMPOSITION

Burkhard Lachmann, Krefeld; Hans Rudolph, Krefeld-Bockum, and Wolfgang Cohnen, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

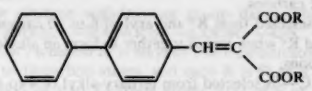
Continuation of Ser. No. 934,311, Sep. 19, 1977, abandoned, which is a continuation of Ser. No. 455,170, Feb. 25, 1974, abandoned. This application Jan. 12, 1979, Ser. No. 2,882

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1973, 2310135

Int. Cl.[2] C08K *5/12*

U.S. Cl. 260—45.85 V 4 Claims

1. A composition comprising an aromatic mixture of a polycarbonate subject to degradation by UV light and a light stabilizing amount of a UV absorbent compound of the formula



wherein R is hydrogen, alkyl having 1 to 12 carbon atoms or cyclohexyl.

4,228,068

PEPTIDE COMPLEXES OF DNA-CONTAINING ORGANISMS

Günter R. Wilhelm, Dreieich, Fed. Rep. of Germany, assignor to R & Z Vermogensverwaltungsgesellschaft mbH, Krefeld, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,549

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717475; Apr. 20, 1977, 2717476; Nov. 5, 1977, 2749554

Int. Cl.[2] C07G *7/00;* A61K *39/00*

U.S. Cl. 260—112 R 3 Claims

1. The peptide complex, obtained from desoxyribonucleic acid-containing organisms, wherein

(a) said organisms and parts or constituents thereof are homogenized in a native or denatured state in 0.2 M phosphate buffer (pH 7.2);

(b) said homogenate is centrifuged;

(c) the supernatant is stirred with phosphate buffer-loaded DEAE cellulose and charged into a column;

(d) the loaded DEAE cellulose is eluted with 0.2 molar phosphate buffer until the absorption of the eluate at 280 nm is below 0.1, and thereafter further eluted with 0.1 M acetic acid-acetate solution (pH 3.2) until the absorption of the eluate at 280 nm is again below 0.1, thereupon eluted with a 3% NaCl containing 0.1 M acetic acid (pH 3.2) and the ribonucleic acid fraction (RNP) appearing in the eluate with the NaCl front is collected, dialyzed against water, concentrated and lyophilized, characterized in that

I. the lyophilized RNP dissolved in water is mixed with phenol, heated to about 95° to 100° C. and, upon cooling, centrifuged until the phases are separated, the phenol phase is mixed with water and then repeatedly shaked out with ether, and the aqueous residue is lyophilized; or

II. the RNP dissolved in water is subjected to high-voltage electrophoresis, and the peptide complex is isolated; or

III. the peptide complex is isolated from the RNP dissolved in water, by thin film chromatography.

4,228,069

AZOXY COMPOUND HAVING USE IN A PROCESS FOR PREPARING FOAMED STRUCTURES

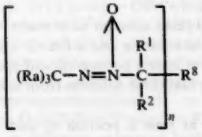
Ronald E. MacLeay, Amherst, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 22, 1979, Ser. No. 22,743

Int. Cl.[3] C07C *107/02;* C08J *9/00*

U.S. Cl. 260—143 4 Claims

1. A compound having the formula

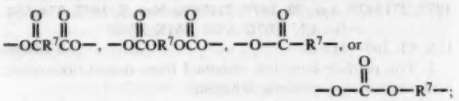


wherein

(a) n is 1 or 2

(b) R^1 is selected from alkyl of 1 to 6 carbons or cycloalkyl of 3 to 12 carbons;
(c) R^2 is selected from R^1 and aryl of 6 to 10 carbons;
(d) R^1 and R^2 when joined together to form an alkylene of 3 to 11 carbons;
(e) $(Ra)_3$ C— is selected from tertiary-alkyl of 4 to 8 carbons, tertiary cycloalkyl of 6 to 11 carbons or tertiary aralkyl of 9 to 12 carbons;
(f) when n is 1, R^8 is selected from

—CN, —OAc, or —OR^4 where R^4 is methyl, ethyl, propyl, isopropyl, or phenyl;
(g) when n is 2, R^8 is selected from —O—,



(h) R^7 is a divalent radical selected from alkylene of 1 to 10 carbons, cycloalkylene of 3 to 6 carbons or phenylene.

4,228,070

PURIFICATION OF PHOTOGRAPHIC IMAGE-FORMING SULFONAMIDO COMPOUNDS EMPLOYING IMMISCIBLE SOLVENTS

Nigel E. Milner, Leighton Buzzard, and Christine C. Payne, London, both of England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 28, 1979, Ser. No. 15,972
Int. Cl.[2] C09B *46/00*
U.S. Cl. 260—152 **18 Claims**

1. A process for purifying a photographic image-forming sulfonamido compound, said process comprising the steps of:
a. preparing a first solution by dissolving an unpurified image-forming sulfonamido compound in an aprotic solvent;
b. removing impurities from said first solution by, at least once:
i. mixing said first solution with an immiscible nonpolar, low-boiling organic solvent to form a mixture of said first solution and a second solution comprising said immiscible nonpolar, low-boiling organic solvent and at least a portion of said impurities; and
ii. separating said first solution from said second solution; and
c. recovering purified image-forming sulfonamido compound from said first solution.

3. The process of claim **1** wherein recovery of said purified image-forming sulfonamido compound is effected by:
a. preparing a third solution by adding to (b)(i) a water-immiscible low-boiling solvent of intermediate polarity to said first solution;
b. removing said aprotic solvent from said third solution by at least once:
i. mixing said third solution with water to form a mixture of said third solution and a fourth solution comprising water and at least a portion of said aprotic solvent; and
ii. separating said third solution from said fourth solution; and
c. evaporating at least a portion of said water-immiscible low-boiling solvent of intermediate polarity from said third solution to effect crystallization of said purified image-forming sulfonamido compound.

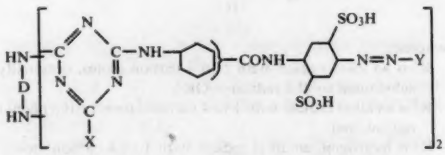
4,228,071

TRIAZINE CONTAINING FIBER-REACTIVE DISAZO DYESTUFFS

Henri Riat, Arlesheim, and Karl Seitz, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 644,772, Dec. 29, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,447
Claims priority, application Switzerland, Jan. 8, 1975, 166/75; Dec. 12, 1975, 16148/75
Int. Cl.[2] C09B *62/08;* **D06P** *1/382, 3/10, 3/66*
U.S. Cl. 260—153 **3 Claims**

1. A fiber-reactive disazo dyestuff of the formula



wherein
X is fluoro, chloro or bromo;
Y is the radical of a coupling component which contains an enolised or enolisable keto group is bound to the azo group in a position adjacent to the enolised or enolisable keto group, said coupling component selected from the group consisting of
dihydroxyquinolines,
hydroxyquinoline-sulphonic acids,
barbituric acid,
3-methyl-5-pyrazolone,
1-phenyl-3-methyl-5-aminopyrazole-4′-sulphonic acid,
1-(2′-chlorophenyl)-3-methyl-5-pyrazolone-5′-sulphonic acid,
α- and β-naphthyl-5-pyrazolone-sulphonic acids,
1-phenyl-3-methyl-5-pyrazolone,
1-phenyl-3-methyl-5-pyrazolone-2′-, -3′- or -4′-sulphonic acid,
1-phenyl-5-pyrazolone-3-carboxylic acid,
1-phenyl-5-pyrazolone-3-carboxylic acid-4′-sulphonic acid,
5-pyrazolone-3-carboxylic acid amide,
1-(2′,5′-dichlorophenyl)-3-methyl-5-pyrazolone-4′-sulphonic acid,
1-(2′-methyl-6′-chlorophenyl)-3-methyl-5-pyrazolone-4′-sulphonic acid,
1-phenyl-3-methyl-5-aminopyrazole,
1-phenyl-3-carboxy-5-aminopyrazole,
2,6-dihydroxy-3-cyano-4-methylpyridine,
1-ethyl-3-cyano-4-methyl-6-hydroxy-pyridone-(2),
1-ethyl-3-aminocarbonyl-4-methyl-6-hydroxy-pyridone-(2),
1-ethyl-3-sulphomethyl-4-methyl-6-hydroxy-pyridone-(2),
acetoacetic acid isopropylamide,
acetoacetic acid cyclohexlamide,
acetoacetic acid monoethanolamide,
acetoacetic acid diethanolamide,
acetoacetylaminobenzene,
acetoacetylaminonaphthalene, and
acetoacetylaminobenzene-2-, -3- or -4-sulphonic acid;
and D is straight or branched chain alkylene of 1 to 6 carbon atoms, N,N′-diphenyleneurea, cyclohexylene, or is naphthylene, diphenylene, stilbenylene or phenylene which are unsubstituted or substituted by halo, lower alkyl, lower alkoxy, amino, ureido, nitro, hydroxy, carboxy or sulfo.

4,228,072
1-(N-ALKYL-N-BENZYL OR SUBSTITUTED BENZYL-N-METHYL(AMMONIUM)ALKYL)-3-CYANO-4-ALKYL-5-(ALKYL-HALO-PHENYL)AZO-6-HYDROXYPYRIDONE-2 COMPOUNDS

Manfred Greve, Dornach, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

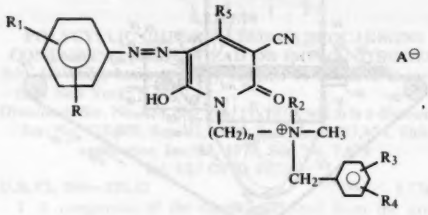
Filed Sep. 19, 1977, Ser. No. 834,127

Claims priority, application Switzerland, Sep. 23, 1976, 12070/76

Int. Cl.[2] **C09B** *29/36*

U.S. Cl. 260—156 **20 Claims**

1. A compound of the formula



wherein

R is chloro or bromo,

R_1 is C_{1-4}alkyl,

R_2 is methyl, ethyl, n-propyl or n-butyl, each of R_3 and R_4 is independently hydrogen, chloro, bromo or methyl,

R_5 is methyl or ethyl,

n is 2 or 3, and

$A^{\ominus}$ is an anion.

4,228,073
NONDIFFUSIBLE AZO DYE-RELEASING COMPOUNDS

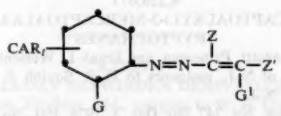
Derek D. Chapman, Rochester, and E-Ming Wu, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 950,193, Oct. 10, 1978, Pat. No. 4,183,755, which is a division of Ser. No. 892,561, Apr. 3, 1978, Pat. No. 4,148,643. This application Mar. 29, 1979, Ser. No. 25,146

Int. Cl.[2] **C09B** *29/32, 33/12, 33/14*

U.S. Cl. 260—176 **16 Claims**

1. A nondiffusible compound having at least one diffusible azo dye moiety, said compound having the formula:



wherein:

G is a metal chelating group, a salt thereof or a hydrolyzable precursor thereof; or a group which together with a

group is CAR, said CAR being bonded to the benzene ring through the oxygen of said

group;

G^1 is hydroxy, a salt thereof, or a hydrolyzable precursor thereof;

Z is an electron withdrawing group having the formula $—CON(R)_2$, $—SO_2N(R)_2$, —COOR, —CN, SO_2R' or —COR', wherein R' is alkyl of 1 to 8 carbon atoms or aryl of 6 to 10 carbon atoms, and each R is H or R';

Z' is alkyl of 1 to 8 carbon atoms, aryl of 6 to 10 carbon atoms or $N(R)_2$;

CAR represents a ballasted carrier moiety which will release said diffusible azo dye as a function of development of a silver halide emulsion layer under alkaline conditions; and

t is an integer of 0 to 1, with the proviso that the compound contains at least one but not more than two CAR groups.

4,228,074
AZETIDINONE DERIVATIVES

Peter C. Cherry, South Harrow; Christopher E. Newall, Ealing, and Nigel S. Watson, Greenford, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

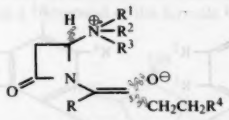
Filed Sep. 8, 1977, Ser. No. 831,549

Claims priority, application United Kingdom, Sep. 9, 1976, 37444/76; Sep. 9, 1976, 37481/76

Int. Cl.[2] **C07D** *205/08, 405/12, 413/04, 417/04*

U.S. Cl. 260—239 A **7 Claims**

1. A compound of the formula (I)



(I)

or a salt thereof with a carboxylic, sulphonic or mineral acid, wherein R is a group of formula $—COOR^{16}$ and R^{16} is selected from the group consisting of C_{1-8} alkyl and C_{2-8} alkenyl, optionally substituted by methoxy, cyano, alkanoyloxy, p-bromobenzoyl or alkoxycarbonyl; benzyl; diphenylmethyl; triphenylmethyl; benzyl substituted on the ring by nitro, sulphonyl, cyano, alkyl or alkoxy, said substituted benzyl having up to 20 carbon atoms; a phenyl group optionally substituted by nitro, alkyl or alkoxy, said substituted phenyl group containing up to 12 carbon atoms; a cycloalkyl group containing up to 12 carbon atoms; a tetrahydropyranyl group; a phthalidyl group; and a stannyl group having up to 24 carbon atoms carrying three substituents selected from the group consisting of alkyl, alkenyl, phenyl, benzyl, cycloalkyl and alkoxy; R^1, R^2 and R^3, which may be the same or different, represent an alkyl group having up to 8 carbon atoms, a benzyl group or a C_{3-7} cycloalkyl group, or two of R^1, R^2 and R^3 form, together with the nitrogen atom to which they are attached, a piperidino, morpholino or thiamorpholino group or R^1, R^2 and R^3 together may form part of a pyridinium, collidinium or quinuclidinium group; and R^4 represents (i) a hydrogen atom; (ii) a hydroxyl group; (iii) a group $—OR^5$, wherein R^5 is an unsubstituted alkyl, alkenyl or alkynyl group containing up to 6 carbon atoms; a C_{1-16} alkyl group carrying a group $R^6CO_2—$ or $R^6O—$ where R^6 is a C_{1-4} alkyl group, or carrying a C_{2-6} alkanoyl, carboxyl, C_{2-6} alkoxycarbonyl or cyano group; a hydroxyalkyl group having 2–6 carbon atoms; a 4-nitrobenzyl, benzyl, phenethyl, phenyl or tetrahydropyranyl group; or a cycloalkyl group having 3–7 carbon atoms optionally carrying a C_{1-4} alkoxy group; (iv) a group $—OR^7$ wherein R^7 represents a group $R^8CO—$ wherein R^8 is a C_{1-8} alkyl, C_{2-8} alkenyl, or C_{3-12} cycloalkyl group, which R^8 group may be substituted by a hydroxyl, C_{1-4} alkoxy, phenoxy, cyano or amino group or R^8 is a benzyl, thienylmethyl, phenyl, thienyl, α-benzyloxycarbonylbenzyl, α-phenoxycarbonylbenzyl or α-aminobenzyl group; (v) a group $O.CONR^9R^{10}$ wherein R^9 and R^{10}, which may be the same or different, represent hydrogen; C_{1-5} alkyl; C_{2-6} alkanoyl, or a benzyl or phenyl group; (vi) a group $OCSNHR^9$ wherein R^9 is as hereinbefore defined other than

hydrogen; (vii) the residue of a sulphur nucleophile represented by —SH, —SR^{11}, —SOR^{11} or —$SC{=}YR^{12}$ wherein R^{11} represents an alkyl, alkenyl or alkynyl group of up to 6 carbon atoms or a benzyl, phenyl or pyridyl group, all such groups R^{11} being unsubstituted or carrying a substituent selected from the group consisting of hydroxy, a group —OR^6 or R^6CO_2—, where R^6 is as hereinbefore defined, carboxyl, amino, cyano, a group of formula —$COOR^{15}$ where R^{15} is C_{1-4} alkyl, and a group of formula —$NR^{13}R^{14}$ where R^{13} and R^{14}, which may be the same or different, represent hydrogen or C_{1-4} alkyl; and R^{12} is a group as defined for R^{11}, or is a group —OR^{11}, —SR^{11} or —$NR^{13}R^{14}$ where R^{13} and R^{14} are as hereinbefore defined; and Y represents oxygen or sulphur; or (viii) a group OR^5 wherein R^5 represents a silyl group carrying three substituents which may be the same or different C_{1-4} alkyl groups, wherein all substitution is monosubstitution.

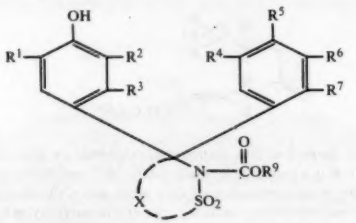
4,228,075

NOVEL SULFAM(NA)PHTHALEINS

Stanley M. Bloom, Waban; Alan L. Borror, Lexington, and James W. Foley, Andover, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1977, Ser. No. 836,009
Int. Cl.[2] **C07D** *275/06, 417/10, 279/02;* **C09B** *17/04*
U.S. Cl. 260—243.3 **30 Claims**

1. A compound of the formula



wherein R^1 and R^2 each are selected from hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro and fluoro; R^3 is hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms or hydroxy; R^2 and R^3 taken together represent the carbon atoms necessary to complete a fused benzene ring; R^4 and R^6 each are selected from hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, chloro and fluoro; R^7 is hydrogen, hydroxy, alkyl having 1 to 4 carbon atoms or alkoxy having 1 to 4 carbon atoms; R^6 and R^7 taken together represent the carbon atoms necessary to complete a fused benzene ring provided R^2 and R^3 are taken separately when R^6 and R^7 are taken together; R^5 is selected from hydrogen, hydroxy, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, —N,N-(dialkyl)amino wherein each alkyl contains 1 to 4 carbon atoms, —N,N-(w-R^8alkyl)$_2$amino wherein R^8 is hydroxy or halo and said alkyl contains 1 to 4 carbon atoms, —NH-$COCH_3$, piperidino, pyrrolidino, N-methylpiperazino, morpholino, thiomorpholino or tetrahydro-2H,4H-1,3,6-dioxazocino; R^4, R^5 and R^6 taken together represent the atoms necessary to complete a fused quinolizidine ring; X represents the atoms necessary to complete 2,3-dihydrobenzisothiazole-1,1-dioxide or 2,3-dihydronaphtho-1,2-thiazine-1,1-dioxide; and R^9 is selected from lower alkyl having 1 to 4 carbon atoms and phenyl, unsubstituted or substituted with at least one electron-withdrawing group having a positive sigma value as defined by Hammett's Equation selected from the group consisting of fluoro, chloro, bromo, cyano, —SO_2CH_3,

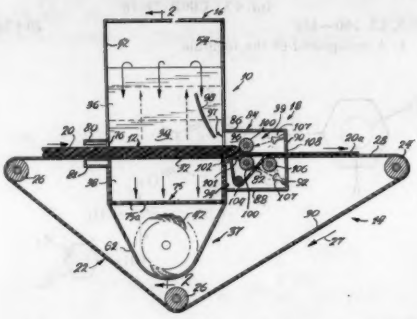
and —$COCH_3$.

4,228,076

METHOD OF DENSIFYING OPEN-CELLED POLYURETHANE MATERIAL

Winslow L. Pettingell, Wooddale, Ill., assignor to Foam Cutting Engineers, Inc., Addison, Ill.

Continuation-in-part of Ser. No. 876,736, Feb. 10, 1978, abandoned. This application May 31, 1979, Ser. No. 44,042
Int. Cl.[2] **B29D** *27/00*
U.S. Cl. 264—321 **10 Claims**



1. A method of densifying a mass of fully cured open-celled polyurethane foam, said method comprising the consecutive steps of:

passing heated gaseous material entirely through the mass, the temperature of said gaseous material being in the range of about 425° F. to 460° F. and the velocity of said gaseous material being insufficient to destroy the integrity of the cell walls of the mass, said gaseous material being inert with respect to the polyurethane, and the period of exposure of the mass to the gaseous material being insufficient to allow charring of the mass, yet sufficient to raise the entire mass substantially uniformly to a temperature between about 365° F. and 435° F.;

compressing the mass while its temperature is between about 365° F. and 435° F. to reduce its thickness and thus increase its density to a desired degree; and

permitting the mass to cool.

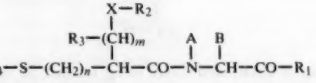
4,228,077

N-[2-(MERCAPTOALKYL)-3-MERCAPTOALKANOYL]-L-TRYPTOPHANES

Miguel A. Ondetti, Princeton, and Frank L. Weisenborn, Titusville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 747,280, Dec. 3, 1976, Pat. No. 4,116,962. This application Mar. 24, 1978, Ser. No. 889,767
Int. Cl.[3] **C07D** *209/20;* **A61K** *31/405*
U.S. Cl. 260—326.14 T **6 Claims**

1. A compound of the formula



and physiologically acceptable basic salts thereof, wherein

R_1 is hydroxy or lower alkoxy;

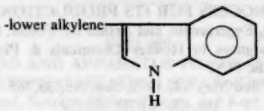
R_2 is hydrogen, lower alkyl or lower alkanoyl;

R_3 is hydrogen or lower alkyl;

R_4 is hydrogen, lower alkanoyl, or benzoyl

A is hydrogen, lower alkyl or hydroxy-lower alkylene;

B is



X is oxygen or sulfur;
m is zero, 1, 2, 3 or 4; and
n is zero or 1.

4,228,078

POLYCYCLIC CHLORINATED HYDROCARBONS CONTAINING BRIDGEHEAD OR IMINO NITROGEN

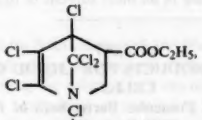
John L. Wong, Louisville, Ky., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 878,794, Feb. 17, 1978, which is a division of Ser. No. 725,578, Sep. 22, 1976, Pat. No. 4,087,434. This application Jan. 31, 1979, Ser. No. 7,979

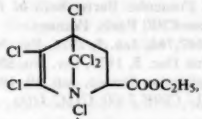
Int. Cl.[2] C07D *487/08*

U.S. Cl. 260—326.32 **1 Claim**

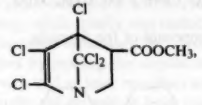
1. A compound of the formula selected from the group consisting of



(A)

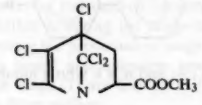


(B)



(C)

and



(D)

4,228,079

DIALKOXY MONORDEN DERIVATIVES

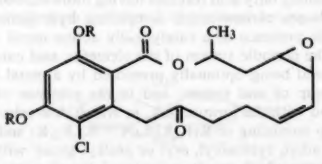
Gary J. Calton, Elkridge, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 874,348, Feb. 1, 1978, abandoned. This application Oct. 30, 1978, Ser. No. 955,705

Int. Cl.[2] C07D *493/04*

U.S. Cl. 260—343.41 **3 Claims**

1. Dialkoxy monorden corresponding to the structural formula:



wherein R is an alkyl group having 3 carbon atoms, said R groups being the same and selected from the group consisting of propyl or isopropyl.

4,228,080

PROCESS FOR THE PREPARATION OF METHYL 3,4-ANHYDRO-2,6-DIDEOXY-L-RIBO-HEXOPYRANOSIDE

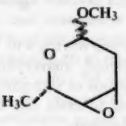
Guenter Grethe, North Caldwall; Milan R. Uskokovic, Upper Montclair, and John Sereno, Pine Brook, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 850,982, Nov. 14, 1977, Pat. No. 4,174,344. This application Jun. 13, 1979, Ser. No. 48,310

Int. Cl.[3] C07D *311/00*

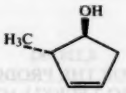
U.S. Cl. 260—345.9 R **1 Claim**

1. A process to produce a compound of the formula



its enantiomer and racemate thereof which comprises

(a) oxidizing a compound of the formula



its enantiomer and racemate thereof with an aromatic or aliphatic peracid in an inert organic solvent,

(b) oxidizing the product of (a) with an oxidizing agent selected from the group consisting of sodium or potassium dichromate, chromium trioxide or an aliphatic or aromatic peracid,

(c) oxidizing the product of (b) with an aromatic or aliphatic peracid in an inert organic solvent,

(d) reducing the product of (c) with a reducing agent selected from the group consisting of diisobutylaluminum hydride, diborane, sodium or lithium triethoxyaluminumhydride, sodium-bis (2-methoxyethoxy)aluminumhydride and tri-t-butoxyalumino-hydride and

(e) reacting the product of (d) with methanol in the presence of an acid catalyst.

4,228,081

SEPARATION OF ISOMERS

Ronald F. Mason, Westwell, and Derek A. Wood, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 4, 1979, Ser. No. 71,980

Claims priority, application United Kingdom, Sep. 27, 1978, 38331/78

Int. Cl.[2] C07D *209/52*

U.S. Cl. 260—326.62 **4 Claims**

1. A method for separating the cis- and trans- isomeric forms of 3-azabicyclo(3.1.0)hexane-2-carbonitrile from mixtures thereof which comprises extracting a mixture of the benzenesulfonic acid or toluenesulfonic acid salts of the isomers with a solvent selected from one or more of water, methanol and ethanol, recovering separately the salts in the extract and the extracted solid phase.

3. A salt selected from the benzenesulfonic acid and toluenesulfonic acid salts of 3-azabicyclo(3.1.0)hexane-2-carbonitrile.

4,228,082

N-SUBSTITUTED α-KETOCARBOXYLIC ACID AMIDES

Axel Kleemann; Herbert Klenk; Heribert Offermanns, all of Hanau; Paul Scherberich, Dietzenbach, and Werner Schwarze, Frankfurt, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

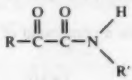
Division of Ser. No. 926,322, Jul. 20, 1978. This application Jul. 9, 1979, Ser. No. 56,084

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733181

Int. Cl.[1] C07D *307/54;* C07C *103/737, 103/76*

U.S. Cl. 260—347.3 12 Claims

1. A compound having the formula



(I)

where R' is a t-alkyl group having 4 to 18 carbon atoms and R is halophenyl, nitrophenyl, alkoxyphenyl, furyl, cycloalkyl having 3 to 8 carbon atoms or substituted cycloalkyl having 3 to 8 carbon atoms and wherein the substituents are 1 to 3 carbon atom alkyl or halogen.

4,228,083

PROCESS FOR THE PRODUCTION OF β-(5-NITRO-2-FURYL)-ACROLEIN

Emmerich Pastorek, Hemsbach; Winfried Orth, Hassloch, and Werner Fickert, Mannheim, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 8, 1979, Ser. No. 92,324

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855245

Int. Cl.[1] C07D *307/71*

U.S. Cl. 260—347.8 9 Claims

1. An improved process for the production of β-(5-nitro-2-furyl)-acrolein by reacting 5-nitro-furfural and acetaldehyde in the presence of a secondary amine, the improvement comprises effecting the reaction in an aliphatic carboxylic acid of 2 to 4 carbon atoms.

4,228,084

PROCESS FOR THE PRODUCTION OF GLYCIDYL METHACRYLATE

Rolf Ackermann; Heinz Kolb; Gerhard Morlock, and Gerd Schreyer, all of Hanau, Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Jun. 3, 1976, Ser. No. 692,371

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2525026

Int. Cl.[1] C07D *301/00*

U.S. Cl. 260—348.12 9 Claims

1. A process for producing glycidyl methacrylate by transesterifying methyl methacrylate with glycidol in the presence of a polymerization inhibitor and a transesterification catalyst, the improvement comprising employing as the catalyst a salt of the formula MeX where Me is an alkali metal ion and X is a cyanide, cyanate or thiocyanate.

4,228,085

PHENYL-ALPHA,BETA-EPOXY-BETA-(3-TRIFLUOROMETHYLPHENYL)ETHYL KETONE AND PROCESS FOR ITS PRODUCTION

David Y. Tang, Eggertsville, and Arthur M. Foster, Snyder, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 14, 1979, Ser. No. 38,765

Int. Cl.[2] C07D *303/32*

U.S. Cl. 260—348.49 1 Claim

1. Phenyl alpha,beta-epoxy-beta-(3-trifluoromethylphenyl-)ethyl ketone.

4,228,086

N-SUBSTITUTED ALKYL-N-NITROSOCARBAMOYL AZIDES

Gerhard Eisenbrand, Banngartenstrasse 19, 6902 Sandhausen, Fed. Rep. of Germany

Division of Ser. No. 800,452, May 25, 1977, Pat. No. 4,150,146. This application Mar. 21, 1979, Ser. No. 22,714

Claims priority, application Fed. Rep. of Germany, May 25, 1976, 2623420

Int. Cl.[2] C07C *117/00*

U.S. Cl. 260—349 8 Claims

1. N-haloalkyl-N-nitrosocarbamoyl azide.

6. Process for the preparation of the compound claimed in claim 1, which comprises reacting a haloalkyl carbamoyl azide with nitrogen tetroxide in an inert solvent in the cold.

4,228,087

MESOGENIC PRODUCTS FOR LIQUID CRYSTAL CELLS

Jean C. Dubois, and Francoise Barre, both of Paris, France, assignors to Thomson-CSF, Paris, France

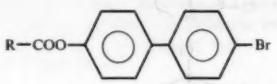
Division of Ser. No. 647,745, Jan. 7, 1976, Pat. No. 4,112,239. This application Dec. 5, 1977, Ser. No. 857,611

Claims priority, application France, Jan. 10, 1975, 75 00719

Int. Cl.[2] C09F *7/00;* C11C *3/00*

U.S. Cl. 260—408 3 Claims

1. A mesogenic compound of the formula:



wherein R is $C_nH_{2n+1}-$; and n is a whole number from 1 to 20.

4,228,088

SELECTIVE HYDROGENATION

Jan Kuiper, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 970,836, Dec. 18, 1978, abandoned. This application Apr. 6, 1979, Ser. No. 27,621

Claims priority, application United Kingdom, Dec. 19, 1977, 52750/77

Int. Cl.[3] C11C *3/12*

U.S. Cl. 260—409 12 Claims

1. Process for the selective hydrogenation of triglyceride oils containing fatty acid residues having more than one double bond between carbon atoms comprising hydrogenating said oils in the presence of a catalytically active metal of group VIII of the periodic system of the elements, said catalytically active metal being optionally promoted by a metal from another group of said system, and in the presence of a basic compound with the formula AX, in which A is selected from the group consisting of $R_1R_2R_3R_4N^+$; R_1,R_2,R_3 and R_4 each being an alkyl, cycloalkyl, aryl or aralkyl group with 1 to 20 carbon atoms which may be substituted; the elements of group I or II of the periodic system, and ammonium, and X is selected

from the group consisting of hydroxyl, an anion of a weak acid and RO—, in which R is an alkyl group.

4,228,089

METHOD AND APPARATUS FOR FRACTIONAL CRYSTALLIZATION SEPARATION

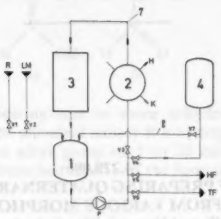
Rudolf Bischof, Sevelen; Heinz Rhyner, and Kurt Saxer, both of Buchs, all of Switzerland, assignors to Metallwerk AG Buchs, Buchs, Switzerland

Filed May 24, 1978, Ser. No. 908,986

Claims priority, application Switzerland, May 31, 1977, 6639/77; Apr. 24, 1978, 4367/78

Int. Cl.[3] **C09F** *5/10;* **C11B** *3/00;* **B01D** *35/18*

U.S. Cl. 260—428.5 **33 Claims**



1. A method for fractionation of a mixture of fatty acid esters materials dissolved in a solvent, said method comprising circulating and cooling the solution in a circuit,

said circuit comprising a circulating pump, a cooler, a heater, a storage tank and a fractionation column,

said fractionation column further comprising at least one filter surface,

stage (1) lowering the temperature gradually, causing formation of crystals suspended within said solution, said crystals forming while totally suspended within the solution, and continuously separating the crystals from the circulating solution by passing the crystal-containing solution in contact with said at least one filter surface whereby crystals are collected on said at least one crystal surface and then recovering the material forming said crystals, and

stage (2) further lowering the temperature of said solution and repeating the procedure of stage (1) whereby crystals having a lower crystallization temperature than those formed in stage (1) are formed and collected on said at least one filter surface.

4,228,090

COMPOSITIONS CONTAINING PLATINUM

Paul C. Hydes, and David M. Watkins, both of Reading, England, assignors to Johnson, Matthey & Co., Limited, London, England

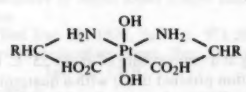
Filed Apr. 18, 1979, Ser. No. 31,875

Claims priority, application United Kingdom, Apr. 20, 1978, 15658/78; May 26, 1978, 22966/78

Int. Cl.[2] **C07F** *15/00*

U.S. Cl. 260—429 R **1 Claim**

1. A coordination compound of platinum having the structure:



in which R is H or Me.

4,228,091

REMOVAL OF NICKEL FROM COBALT AND MANGANESE

Walter Partenheimer, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 1,953

Int. Cl.[2] **C07F** *15/04, 15/06, 11/00*

U.S. Cl. 260—439 R **4 Claims**

1. The method of recovery of cobalt or manganese or cobalt and manganese dissolved in water also containing ions of copper, iron and nickel in amounts of copper above 80 to 100 weight parts, of nickel above 6700 weight parts and of iron above 500 to 5000 weight parts each per million weight parts of cobalt by precipitating cobalt, manganese or cobalt and manganese as their carbonates, the improvement of adding to the aqueous solution before the carbonate precipitation at least 2.5 moles of nitrilotriacetate per 1.0 gram mole of total of said metals.

4. The method of claim **3** wherein following the carbonate precipitation of cobalt and manganese the metal carbonate precipitate is recovered from the aqueous solution, heated with aqueous acetic acid containing 50 to 60 weight percent acetic acid and 50 to 40 percent water by weight in an amount to provide 1.05 to 1.2 times the theoretical amount of acetic acid to convert the metal carbonates to acetates until a solution of metal acetates is formed, further heating the solution of acetates to evaporate acetic acid to a solution pH of 4.5 to 5.8, and separating the solution from the precipitate which forms at such pH.

4,228,092

PROCESS FOR THE PREPARATION OF ORGANOALKOXYSILANES

Hans-Joachim Kötzsch; Claus-Dietrich Seiler, both of Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 605

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800017

Int. Cl.[2] **C07F** *7/04, 7/18*

U.S. Cl. 556—422 **8 Claims**

1. An improvement in a process for the esterification of an organochlorosilane by feeding alcohol into a chlorosilane maintained within a reaction zone without said alcohol contacting said chlorosilane in the gas phase wherein the esterification is performed stepwise with extraction of hydrogen chloride which has developed, the improvement which comprises employing in at least a final esterification step an organochlorosilane of the formula

$$H_aR_bSi\,Cl_{4-a-b}$$

wherein

R represents an optionally halogen-substituted alkyl radical which can also contain an oxygen or sulfur atom in the chain or a halogen or a NO_2 group or a protected phenolic group containing aryl radical

a equals 0, 1, or 2,

b equals 1 or 2, and

a+b amounts to a maximum of 3,

said final esterification step being performed with the addition of heat, said final esterification step being carried out at the boiling temperature of the reaction mixture.

4,228,093
(11Z,13Z)-11,13-HEXADECADIYN-1-OL AND (11Z,13Z)-11,13-HEXADECADIEN-1-OL AND TRIMETHYLSILYL ETHERS THEREOF

Robert L. Carney, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Oct. 18, 1979, Ser. No. 86,233
Int. Cl.³ C07F 7/18; C07C 33/04
U.S. Cl. 556—482 **3 Claims**

1. The compound, (11Z,13Z)-11,13-hexadecadyin-1-ol, and the trimethylsilyl ether thereof.

4,228,094
ETHYLENE GLYCOL EXTRACTION PROCESS

David R. Bryant, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,853
Int. Cl.² C07C 29/24
U.S. Cl. 260—450 **6 Claims**

1. The process of separating ethylene glycol from admixture with tetraglyme containing rhodium therein which ethylene glycol and rhodium are provided by the homogeneous liquid phase reaction in the presence of rhodium as a carbonyl complex of oxides of carbon and hydrogen wherein the tetraglyme is a solvent therefor, which comprises contacting said admixture with an amount of glycerine greater than that amount which is soluble in said admixture thereby forming two liquid phases, one which is richer in glycerine and the other containing the greater concentration of tetraglyme and causing at least a portion of said ethylene glycol to enter the phase richer in glycerine, maintaining the greater portion of the rhodium with the phase containing the greater concentration of tetraglyme, and recovering ethylene glycol from said glycerine.

4,228,095
PROCESS FOR THE PREPARATION OF LIQUID CARBODIIMIDE-MODIFIED ORGANIC POLYISOCYANATES EMPLOYING ORGANOTIN CATALYSTS

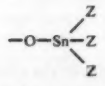
Thirumurti Narayan, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 20, 1979, Ser. No. 67,793
Int. Cl.² C07C 119/055
U.S. Cl. 260—453 AM **10 Claims**

1. A process for the preparation of a liquid carbodiimide-modified organic polyisocyanate comprising:

a. heating an organic polyisocyanate to a temperature greater than 200° C. for a period ranging from 0.5 hour to 5 hours in the presence of a catalytically sufficient amount of an organotin compound selected from the group consisting of a quadrivalent organotin compound described by the following formula:

wherein Z and Z′ are individually alkyl, aryl, alicyclic, heterocyclic, oxyalkyl or acyloxy group having from 1 to 18 carbon atoms and may be the same or different, X is an alkyl, aryl, alicyclic, heterocyclic, oxyalkyl, acyloxy, thioalkyl or thioalkylene acyloxy group having 1 to 18 carbon atoms, Y is equal to X or oxy groups or a group represented by the following formula:



provided that when Y is this group, X is an alkyl or aryl group, m is equal to 1 except when Y is an oxy group then m is equal to 0, and

a divalent organotin compound described by the following formula:

$Sn(OOCZ'')_2$

wherein Z″ is alkyl, aryl, alicyclic, heterocyclic having from 1 to 18 carbon atoms,

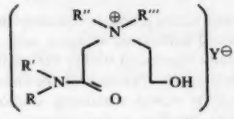
b. stopping the reaction by cooling the product resulting from step (a) to a temperature of less than 30° C.

4,228,096
METHOD OF PREPARING QUATERNARY AMMONIUM SALTS FROM VARIOUS MORPHOLINONES

John W. Bozzelli, and Nancy J. Morris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 908,191, May 22, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,583
Int. Cl.² C07C 141/04, 103/183, 103/28
U.S. Cl. 260—459 A **9 Claims**

1. A method for preparing a compound of the formula



(I)

where

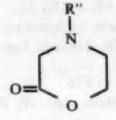
R, R′ and R‴ are individually hydrogen, an aliphatic, alicyclic, aryl or an inertly-substituted aliphatic, alicyclic or aryl radical;

R″ is a C_1–C_5 alkyl radical; and

$Y^{\ominus}$ is a neutralizing anion,

the method comprising:

(a) contacting at a temperature of about 50° C. to about 250° C. a morpholinone of the formula



(II)

with an amidating agent of the formula

and

(b) contacting at a temperature of about 25° C. to about 150° C. the reaction product of (a) with a quaternizing agent of the formula R‴Y where R, R′, R″, R‴ and Y are as previously defined.

4,228,097
METHOD OF PREPARING α-HYDROXYMETHYLENE NITRILES

Moustafa El-Chahawi, Troisdorf, and Uwe Prange, Niederkassel-Ranze, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

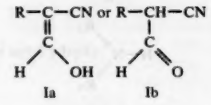
Filed Nov. 27, 1978, Ser. No. 963,713

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753322

Int. Cl.[2] C07C *121/34, 121/75, 121/76*

U.S. Cl. 260—465 F **16 Claims**

1. A method for the preparation of a compound of the formula

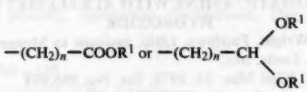


Ia Ib

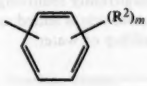
or salt thereof bearing one or more α-hydroxymethylene groups, wherein the univalent moiety R is hydrogen, a straight chain or branched alkyl group of 1 to 20 carbon atoms, a straight chain or branched moiety of the formula

$$-(CH_2)_n\,CN$$

wherein n is from 0 to 5, a straight chain or branched moiety of the formula

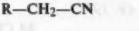


wherein each R^1 independently represents an alkyl radical of 1 to 12 carbon atoms, or a univalent phenol moiety and n has the meaning above, a substituted or unsubstituted moiety of the formula



with m = 1 to 3,

wherein R^2 is hydrogen, an alkyl group of 1 to 6 carbon atoms, a $-(CH_2)_n-COOR^1$, chlorine, bromine, or $-OR^1$, CF_3, $-(CH_2)_n-CN$, where n and R^1 have the meanings given above, which comprises contacting a nitrile of the formula

 II

wherein R has the meaning given above with carbon monoxide in the presence of an alcoholate and a solvent.

4,228,098
PROCESS FOR THE PREPARATION OF ACRYLONITRILE

Kunitoshi Aoki; Makoto Honda, both of Tokyo; Tetsuro Dozono, Yokosuka, and Tsutomu Katsumata, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 20, 1978, Ser. No. 971,293

Claims priority, application Japan, Dec. 31, 1977, 52-159797

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465.3 **8 Claims**

1. A process for the preparation of acrylonitrile by the gaseous phase reaction of propylene with ammonia and molecular oxygen in the presence of a catalyst, characterized in that the sole catalyst is:

a catalyst composition represented by the following general formula

$$A_aMoBi_bFe_fNa_nP_pO_q$$

wherein

A is at least one element selected from potassium, rubidium and cesium;

a, b, f, n, p and q are numbers respectively representing atomic ratios of A, bismuth, iron, sodium, phosphorus and oxygen relative to one atom of molybdenum, provided that;

a is a number of 0.002 to 0.2;

p is a number of 0 to 0.2;

q is the number of oxygens required to satisfy the valence requirements of the other elements present; and

b, f and n are numbers respectively defined by the following formulae

$$b = \frac{(1-X)(1-Y)(1-Z)}{Y} + \frac{1}{2}Z + p,$$

$$f = \frac{X(1-Y)(1-Z)}{Y} \text{ and } n = \frac{1}{2}Z$$

wherein

X and Y are respectively numbers falling within the area defined by a quadrilateral formed by lines connecting points (0.45, 0.35), (0.45, 0.65), (0.85, 0.50) and (0.85, 0.65) on an XY diagrammatic system of coordinates; and

Z is a number of 0 to 0.6; said catalyst composition being supported on 30 to 70% by weight, based on said catalyst, of silica.

4,228,099
ORNITHINE AND ARGININE SALTS OF BRANCHED CHAIN KETO ACIDS AND USES IN TREATMENT OF HEPATIC AND RENAL DISORDERS

Mackenzie Walser, Ruxton, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 17, 1978, Ser. No. 887,570

Int. Cl.[2] C07C *101/00, 101/02*

U.S. Cl. 260—501.11 **8 Claims**

1. Compounds of the formula:

$$AK.xH_2O$$

wherein A is selected from the group consisting of arginine and ornithine, K is an alpha keto analog of a branched chain essential amino acid, and x varies from zero to about one.

4,228,100
QUATERNARY UREIDOMETHYL PHOSPHONIUM SALTS

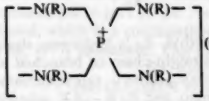
Arlen W. Frank, Slidell, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 6, 1979, Ser. No. 27,696

Int. Cl.[3] C07F *9/22;* **C07C** *127/15;* **C09K** *3/28*

U.S. Cl. 260—551 P **25 Claims**

1. A quaternary ureidomethyl phosphonium salt having the formula

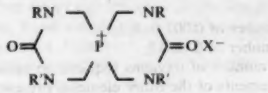


where R, R′ and R″ are radicals selected from the group con-

sisting of hydrogen, alkyl, and substituted alkyl, n is an integer from 2 to 3, and X is an acid radical.

4. A process for preparing a quaternary ureidomethyl phosphonium salt which comprises condensing a urea having the formula RNHC(O)NR'R'', where R, R' and R'' are radicals selected from the group consisting of hydrogen, alkyl, and substituted alkyl, with a quaternary hydroxymethyl phosphonium salt having the formula $(HOCH_2)_4P^+X^-$, where X is an acid radical, in a molar ratio of from 2:1 to 3:1, and revovering the product from the resulting reaction mixture.

9. A quaternary ureidomethyl phosphonium salt having the formula



wherein R and R' are radicals selected from the group consisting of alkyl and substituted alkyl, and X is an acid radical.

4,228,101

TWO DICHLOROACETAMIDE ANTIDOTES FOR NON-SELECTIVE HERBICIDES PARTICULARLY ACTIVE IN THE PROTECTION OF MAIZE AGAINST THE POISONOUS ACTION EXERTED BY HERBICIDES ESTERS OF N,N-DISUBSTITUTED GLYCINE

Franco Gozzo, San Donato Milanese; Luigi Abbruzzese, Milan, and Giorgio Siddi, San Donato Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 21, 1978, Ser. No. 971,713

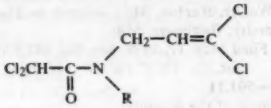
Claims priority, application Italy, Dec. 23, 1977, 31189 A/77

The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.

Int. Cl.[3] **C07C** *103/27*

U.S. Cl. 260—561 HL **3 Claims**

1. Compounds of formula:



wherein R=ethyl or 1,1-dimethylpropargyl.

4,228,102

PREPARATION OF CARBOXYLIC ACID AMIDES

Siegmund Besecke, Darmstadt; Wolfgang Gaenzler, Darmstadt-Arheilgen, and Guenter Schroeder, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

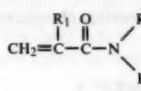
Filed Feb. 23, 1979, Ser. No. 14,361

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809102

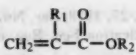
Int. Cl.[3] **C07C** *102/06*

U.S. Cl. 260—561 N **10 Claims**

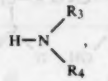
1. A method for making an amide of the formula



wherein R_1 is hydrogen or methyl, R_4 is hydrogen, straight-chain or branched alkyl, or straight-chain or branched alkyl substituted by carboxy, alkoxycarbonyl, (alkyl)carbamoyl, sulfo, sulfoamido, or (alkyl)amino, and R_3 is —AX, wherein A is $-(CR_5R_6)_m$, phenylene, or naphthalene, R_5 is hydrogen or alkyl having 1 to 6 carbon atoms, R_6 is hydroxy or alkyl having 1 to 6 carbon atoms, X is hydrogen, carboxy, alkoxycarbonyl, (alkyl)carbamoyl, sulfo, sulfoamido, or (alkyl)amino and n is a whole number from 1 to 18 if X is other than (alkyl)amino or is a whole number from 2 to 18 if X is alkylamino, which method comprises reacting an ester of the formula



wherein R_2 is alkyl having 1 to 6 carbon atoms, with heating and under pressure, in a homogeneous phase in the presence of a catalytic concentration of protons, with an amine of the formula



said amine being present in an amount which is stoichiometrically deficient up to an amount which is in small stoichiometric excess with respect to said ester.

4,228,103

EFFECTING CONDENSATION OF NITROHALOARENE AND FORMYL DERIVATIVE OF A PRIMARY AROMATIC AMINE WITH ALKALI METAL HYDROXIDE

Robert L. Wright, Fairlawn, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 13, 1978, Ser. No. 885,968

Int. Cl.[2] **C07C** *85/12, 89/00*

U.S. Cl. 260—576 **11 Claims**

1. The process which comprises forming nitrodiarylamine by gradually mixing aqueous alkali metal hydroxide with the formyl derivative of an aromatic primary amine and reactive nitrohaloarene at condensation temperature for forming nitrodiarylamine and concurrently removing water, wherein the aqueous alkali metal hydroxide is added at a rate slow enough to avoid substantial buildup of water.

4,228,104

2-DECARBOXY-2-HYDROXYMETHYL-19-HYDROXY-PG_1 ANALOGS

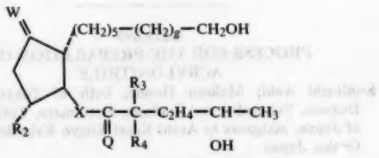
John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 2, 1979, Ser. No. 25,899

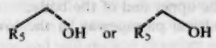
Int. Cl.[3] **C07C** *35/06, 49/395*

U.S. Cl. 568—379 **54 Claims**

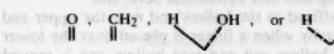
1. A compound of the formula



wherein R_2 is hydrogen, hydroxyl, or hydroxymethyl; wherein R_3 and R_4 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein g is zero, one, two, or three; wherein Q is



wherein R_5 is hydrogen or methyl, wherein W is



and wherein X is cis- or trans-CH=CH— or -C≡C—; with the proviso that W is

only when R_2 is not hydroxy.

4,228,105

4-BIPHENYLYL-4-HYDROXYALKAN-2-ONES

Rüdiger Jeck, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

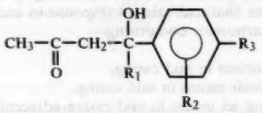
Filed Nov. 27, 1978, Ser. No. 964,046

Claims priority, application Switzerland, Dec. 1, 1977, 14703/77

Int. Cl.[2] **C07C** *49/82*

U.S. Cl. 568—325 **4 Claims**

1. A compound of the formula:



wherein

R_1 is alkyl of 1 to 3 carbon atoms,

R_2 is hydrogen, fluorine, chlorine or bromine; and

R_3 is phenyl or phenyl substituted by fluorine, chlorine, bromine or alkoxy of 1 to 4 carbon atoms.

4,228,106

PROCESS FOR PRODUCING BETA-BROMOETHYL AROMATIC COMPOUNDS

Michael Martan, Rehovot, Israel, assignor to M.C.P. - Chemical Processes Ltd., Rehovot, Israel

Filed Jun. 7, 1979, Ser. No. 46,256

Claims priority, application Israel, Jul. 6, 1978, 55092

Int. Cl.[2] **C07C** *17/08*

U.S. Cl. 570—197 **9 Claims**

1. A process for producing beta-bromo aromatic compounds comprising reacting hydrogen bromide with a vinyl aromatic compound in the presence of an azo radical initiator to effect the anti-markovnikoff addition of HBr to the vinyl double bond.

4,228,107

POLYHALOGENATED HYDROCARBONS, USEFUL AS INSECTICIDE INTERMEDIATES, AND METHODS FOR THEIR PREPARATION

David Holland, Runcorn; David J. Milner, Manchester, and Roger K. Huff, Walesby, Nr. Newark, all of England, assignors to Imperial Chemical Industries Limited, London, England

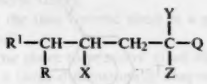
Filed May 17, 1979, Ser. No. 40,047

Claims priority, application United Kingdom, May 25, 1978, 22430/78

Int. Cl.[2] **C07C** *19/08*

U.S. Cl. 570—134 **3 Claims**

1. Polyhalogenated hydrocarbons of general formula:



wherein

R is hydrogen or a lower alkyl group,

R^1 is lower alkyl,

X is chloro, bromo or iodo,

Y is fluoro, chloro or bromo,

Z is Y or Q, and

Q is a group of formula $W(CF_2)_m$—

wherein W is hydrogen, fluoro or chloro and m is 1 or 2, provided that X is always bromo or iodo when at least one of Y and Z is bromo.

3. 5-Methyl-2,2,4-trichloro-1,1,1-trifluorohexane.

4,228,108

2,2-DIALKYLPROPANE-1,3-DIOLBIS[BIS(A-CRYLOYLOXYALKYL)PHOSPHATES]

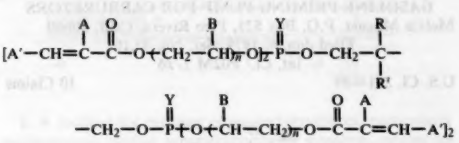
George J. Atchison; Gerald K. McEwen, and Violete L. Stevens, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 13, 1978, Ser. No. 960,383

Int. Cl.[2] **C07F** *9/09;* **C08F** *2/46*

U.S. Cl. 260—928 **2 Claims**

1. A reaction curable compound of the formula



wherein A is hydrogen or methyl; A' is hydrogen, methyl, phenyl or halogen; n is 1 or 1.5 and when n is 1, B is hydrogen or methyl and when n is 1.5, B is hydrogen; Y is oxygen or sulfur; R and R' are hydrogen, methyl, chloromethyl or bromomethyl.

4,228,109

1-ALKYL-2,2-DICHLORO-2(PHOSPHINYL)ACETATES

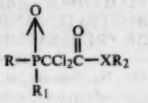
Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 914,756, Jun. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,213, Aug. 26, 1977, abandoned. This application Aug. 1, 1978, Ser. No. 930,599

Int. Cl.[2] **A01N** *9/36;* **C07F** *9/40*

U.S. Cl. 260—941 **10 Claims**

1. A compound of the formula

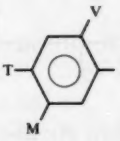


II

wherein

R is alkoxy of 1–6 carbons, alkoxy of 2–3 carbons substituted with alkoxy of 1–3 carbons, or $—NR_3R_4$ wherein

R_3 is hydrogen, alkyl of 1–4 carbons, cycloalkyl of 5–6 carbons, or



where

V is H, F, Cl, NO_2

T is H, F, Cl, Br, C_1–C_3 alkyl, CF_3

M is H, Cl, C_1–C_3 alkoxy, CF_3 provided M and T are not simultaneously CF_3;

R_4 is hydrogen, or alkyl of 1–4 carbons or methoxy provided that when R_4 is methoxy then R_3 is hydrogen or methyl;

R_1 is alkoxy of 1–6 carbons, C_2–C_3 alkoxy substituted with an alkoxy of 1–3 carbons or NR_3R_4;

X is oxygen; and

R_2 is 1-methylethyl or 1-methylpropyl;

provided that

(1) When R and R_1 are both 1-methylethoxy and X is oxygen, R_2 must not be 1-methylethyl;

(2) When R and R_1 are both methoxy or ethoxy and X is oxygen, R_2 must not be 1-methylethyl;

(3) When R and R_1 are both 1-methylpropoxy and X is oxygen, R_2 must not be 1-methylpropyl; and

(4) When R_2 is 1-methylethyl and one of R or R_1 is n-propyloxy then the other of R or R_1 cannot be n-butyloxy.

4,228,110

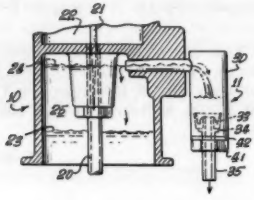
GASOLINE PRIMING PUMP FOR CARBURETORS

Melvin Magnet, P.O. Box 521, Pico Rivera, Calif. 90660

Filed Jun. 4, 1979, Ser. No. 45,101

Int. Cl.³ F02M *1/16*

U.S. Cl. 261—37 **10 Claims**



1. A carburetor having a combination gasoline priming pump and gasoline overflow drain, said carburetor comprising:

a carburetor body having a gasoline reservoir chamber;

a gasoline priming pump air exit and gasoline entry line affixed to and extending through said gasoline reservoir chamber at a level above the normal gasoline level but below the level of gasoline when the chamber is overfilled with gasoline;

a cylindrical body affixed to said line, said body having an axial cylindrical bore, said bore being closed at its upper end, said line passing through the wall of said cylindrical body near the upper end of the body;

an axial, cylindrical passageway in the lower end of said body;

a hollow rod held by said passageway and extending at its lower extremity below the bottom of said clyindrical body and extending into said cylindrical bore; and

piston means affixed to the hollow rod near the upper end thereof whereby when a finger is placed over the lower end of said hollow rod and said hollow rod is moved upwardly, air is forced out of said air exit and gasoline entry line.

4,228,111

VARIABLE VENTURI TYPE CARBURATOR

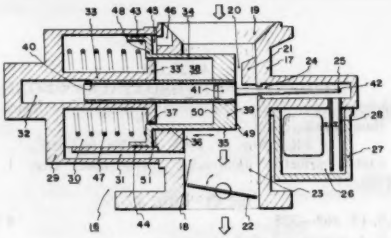
Norihiko Nakamura, Shizuoka, Japan, assignor to Toyoto Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 21, 1979, Ser. No. 41,188

Claims priority, application Japan, Aug. 4, 1978, 53-94534; Nov. 29, 1978, 53-163177[U]

Int. Cl.² F02M *9/06*

U.S. Cl. 261—44 C **10 Claims**



1. A variable venturi carburetor having predictable and stable response characteristics in response to acceleration demands, said carburetor comprising

a casing,

a venturi portion in said casing,

a fuel reservoir means in said casing,

fuel metering jet means in said casing adjacent said venturi portion and adapted to meter fuel to said venturi portion in response to the venturi effect therein, said metering jet means being in communication with said fuel reservoir means,

an air horn portion in said casing adjacent to and in communication with said venturi portion and adapted to provide air thereto,

a mixing chamber portion in said casing adjacent to and in communication with said venturi portion and adapted to receive and mix air and fuel therefrom,

a throttle valve positioned in said mixing chamber and adapted for movement between open and closed positions,

a suction chamber in said casing in communication with said mixing chamber,

guide means in said suction chamber,

suction piston means in slidable and airtight contact with said suction chamber means and connected to said fuel metering jet means so as to control the amount of fuel admitted to said venturi portion,

spring means normally biasing said suction piston means to decrease the amount of fuel provided by said fuel metering jet means.

piston rod means on said suction piston means and positioned relative to said guide means so as to create a first airtight chamber,

a gas damper chamber means between said suction piston means and said guide means, and

a pressure transmission delaying means between said suction chamber and said gas damper chamber means, whereby

movement of said suction piston means is predictably and accurately controlled by the dampening caused by the gradual equalization of pressure between said gas damper chamber means and said suction chamber and the dampening caused by the resistance of the air in said first chamber means to movement of said piston rod means.

4,228,112

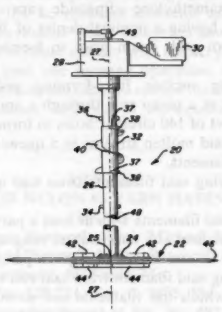
ULTRA-THIN ROTATING DISK GAS DIFFUSER (AND BUBBLE SHEARING METHOD EMPLOYING THE SAME)

Ralph E. Hise, Littleton, Colo., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 801,569, May 31, 1977, abandoned, which is a continuation of Ser. No. 618,257, Sep. 30, 1975, abandoned. This application May 25, 1978, Ser. No. 909,566

Int. Cl.[2] C02C *5/04*

U.S. Cl. 261—87 16 Claims



1. A rotating gas diffuser for shearing fine gas bubbles from the surface thereof when the diffuser is immersed in a body of liquid and rotated therein, which comprises:

a hollow rotatable shaft, said shaft defining a main feed line for the gas to be introduced into said body of liquid,

a disk like member mounted on said shaft perpendicular to the axis of rotation thereof, said member defining at least one gas plenum in operative connection with said main feed line, at least one wall of said plenum being porous to permit the passage of gas through said wall to the outer surface of said disk like member so that the introduction of gas into said main feed line when the gas diffuser is rotating about its axis of rotation while immersed in said body of liquid will cause gas to flow into said gas plenum and out through said porous wall thereof to produce nascent gas bubbles on the surface of said disk like member, which nascent bubbles are sheared off to form fine gas bubbles by the viscous shear forces exerted by said liquid as the disk member rotates in said body of liquid, and

means for minimizing the coalescence of said fine sheared bubbles, resulting from turbulence in the wake and jet surrounding the rotary disk like member that is caused by vortices shed from the edge of the disk like member and spiraling outward from said edge, said means including said disk like member, wherein the ratio of the overall diameter of said disk like member to the maximum thickness thereof in the gas diffusing area occupied by said gas plenums is at least about 32:1.

4,228,113

PROCESS FOR MAKING OBJECTS FROM MINERAL FILLERS BONDED WITH A THERMOSETTING RESIN

Rene L. E. van Gasse, Opglabbeek, Belgium, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Oct. 31, 1978, Ser. No. 956,042

Claims priority, application Netherlands, Nov. 3, 1977, 7712108; Dec. 28, 1977, 7714465

Int. Cl.[2] B29D *3/02, 9/00*

U.S. Cl. 264—24 13 Claims

1. In a process for moulding three-dimensionally shaped article from a molding material including the steps of

(1) forming a pliable sheet of molding material composed of a thermosetting resin, a hardener of said thermosetting resin and mineral fillers;

(2) transferring the thus formed sheet in a pliable condition to a mold; and

(3) subjecting the sheet to pressure at an elevated temperature to form a three-dimensionally shaped article,

the improvement wherein prior to step (2)

(a) at least a portion of the wall of the mold, under conditions of elevated temperature, is provided with at least one layer of a mixture of a powdery thermosetting resin and a catalyst for said resin,

(b) the applied resin of step (a) is allowed to melt and is polymerized at said elevated temperature, and

(c) the pliable sheet is inserted into the thus coated mold and subjected to pressure according to steps (2) and (3).

4,228,114

METHOD FOR THE CONSTRUCTION OF ELONGATED CONCRETE STRUCTURES SUCH AS BRIDGES AND THE LIKE

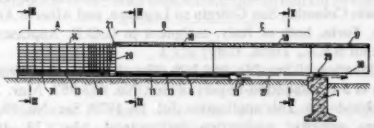
Klaus Alsen; Hans Neidhardt, both of Wiesbaden; Jürgen Maletzke, Mainz, and Johann Wimmer, Hochheim, all of Fed. Rep. of Germany, assignors to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1978, Ser. No. 945,843

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1977, 2743273

Int. Cl.[2] E01D *21/04*

U.S. Cl. 264—33 4 Claims



1. A method for erecting elongated structures, particularly multiple-span bridge superstructures of concrete, across an erection site comprising the steps of: establishing a construction zone at one end of the erection site; providing at said construction zone formwork means within which said structure may be formed in discrete sections; constructing said formwork means to include a formwork bottom and a stationary formwork remainder, with said formwork bottom being separable from said stationary remainder; forming said structure in said formwork means in discrete successive sections; joining each of said successively formed sections to a previously formed section and launching said sections in series from said construction zone to the opposite end of said erection site; providing means for moving said formwork bottom from said erection site in said launching direction together with each of said formed sections of said structure; performing said launching of said sections in series from said construction zone by moving said formwork bottom together with each section formed at said construction zone through one section length in the launching direction across said erection site while maintaining said formwork remainder stationary at said construction site; and subsequently separating said formwork bottom

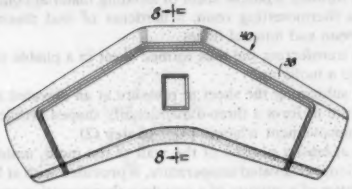
from said formed sections at a location spaced forwardly of said construction site after launching said sections therefrom.

4,228,115

METHOD OF MAKING A HORN PAD

Lawrence B. Gardner, Vandalia, and Philip W. Hopf, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 22, 1979, Ser. No. 23,026
Int. Cl.[2] B79D 27/04
U.S. Cl. 264—46.4 **4 Claims**



1. A method of manufacturing a horn pad assembly which includes a horn switch subassembly having an electrically conductive support plate adapted for mounting on a steering wheel and an electrically conductive switch plate which is spaced and insulated from the support plate by an insulation gasket and which has a pattern of slots rendering the switch plate sufficiently flexible to engage the support plate responsive to finger pressure, comprising the steps of:

enclosing the horn switch subassembly in a sealed bag of heat shrinkable plastic film to mask the pattern of slots in the switch plate,

heat shrinking the heat shrinkable plastic film to provide a relatively smooth and taut enclosure, and

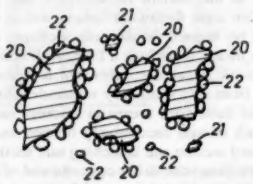
molding a decorative pad of resilient polymeric material onto the portions of the heat shrunk plastic film covering the switch plate and the sides and underside edges of the support plate.

4,228,116

PROCESS FOR PRODUCING REMOLDABLE PANELS

Giancarlo Colombo, San Giorgio su Legnano, and Alberto Ardissone, Turin, both of Italy, assignors to G.O.R. Applicazioni Speciali S.p.A., Turin, Italy

Continuation of Ser. No. 902,968, May 4, 1978, abandoned, which is a continuation-in-part of Ser. No. 453,957, Mar. 22, 1974, abandoned. This application Jul. 19, 1979, Ser. No. 59,107
Claims priority, application Switzerland, Mar. 23, 1973, 4249/73
Int. Cl.[3] B29D 23/00
U.S. Cl. 264—119 **6 Claims**



1. A process for producing remoldable panels from a thermoplastic polymer and an organic filler, said process including the steps of:

(1) providing a mixture comprising from about 40 to about 60% by weight of said thermoplastic polymer in particulate form, having a particle size in the range of from about 200 microns to about 400 microns and a softening point of at least about 150° C., and from about 60 to 40% by weight of substantially dry sawdust having a particle size range of from about 0.1 to 4 mm as an organic filler, aggregatingly combining at least a part of said particulate thermoplastic polymer and said sawdust to form a mass of discrete composite particles each including one sawdust particle as a core and a plurality of thermoplastic particles adhering to the surface of said core particle,

(2) continuously plastifying and extruding said mixture by heating same to a temperature above the softening point of said thermoplastic polymer and below the temperature of substantial decomposition of said sawdust, and then extruding said mixture to form a web, and

(3) calendering said web prior to its solidification.

4,228,117

MELT SPINNING PROCESS FOR PRODUCING NYLON 66 YARNS

Gerald J. Reyenga, and Arnold E. Wilkie, both of Pensacola Beach, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 864,990, Dec. 27, 1977, abandoned. This application Feb. 14, 1979, Ser. No. 11,980
Int. Cl.[3] B28B 3/20
U.S. Cl. 264—176 F **2 Claims**

1. A melt spinning process for producing a package of undrawn polyhexamethylene adipamide yarn composed of 140 filaments each having a nominal denier of 30 without conditioning the yarn with steam prior to forming said package, comprising:

(a) extruding molten fiber-forming polyhexamethylene adipamide at a given rate through a spinneret having at least one set of 140 circular holes to form molten streams,

(b) cooling said molten streams in a quenching chamber to provide filaments,

(c) withdrawing said filaments from said quenching chamber,

(d) passing said filaments with at least a partial wrap around a roll maintained at a temperature ranging from 40° C. to about 150° C. and driven at a given peripheral speed,

(e) forwarding said filament from said roll to a take-up bobbin onto which the filaments are wound to form said package

wherein the extrusion rate and said peripheral speed are correlated to provide a yarn having a nominal denier per filament of 30 and an elongation-to-break of not less than 13.0% when the yarn is drawn to a nominal denier per filament of 6.

4,228,118

PROCESS FOR PRODUCING HIGH TENACITY POLYETHYLENE FIBERS

Wen-Li Wu, and William B. Black, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 3, 1977, Ser. No. 848,168
Int. Cl.[3] D01D 5/12
U.S. Cl. 264—210.8 **15 Claims**

1. A process for preparing a polyethylene fiber having a tenacity of at least 12 grams per denier, comprising:

a. extruding a high density polyethylene having a $\overline{M}_n$ of at least 20,000 and a $\overline{M}_w$ of less than 125,000 through a heated spinneret having at least one orifice to provide at least one molten stream, wherein said heated spinneret is maintained at a temperature between 220° and about 335° C.;

b. solidifying each said molten stream in a quenching zone to form a fiber;

c. withdrawing said fiber from said quenching zone at a velocity of at least 30 meters per minute, and then

d. hot-drawing said fiber at a draw ratio of at least 20:1 while said fiber is in contact with a heated environment, wherein said heated environment is maintained at a temperature between 115° and 132° C.,

said temperatures, said velocity, and said draw ratio being correlated to provide fiber having a tenacity of at least 12

grams per denier, when measured at 72% relative humidity and 25° C. on a bundle of at least 8 filaments using a gauge length of at least 25 centimeters.

4,228,119

CHEMICALLY REDUCING RESIDUAL ACRYLONITRILE MONOMER IN NITRILE POLYMERS AND SHAPED PACKAGING MATERIALS FORMED THEREFROM

I. Luis Gomez, Longmeadow, and Edward F. Tokas, West Hatfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 2, 1978, Ser. No. 957,295
Int. Cl.[2] C08L *33/20, 91/00*; D01F *1/10*
U.S. Cl. 264—211 **41 Claims**

1. In the process of melting an acrylonitrile copolymer by physical working in the presence of free acrylonitrile monomer, the improvement which comprises having a scavenging amount of a C_{18} unsaturated fatty acid compound, which is an acid or a glyceride thereof in admixture with the copolymer during said melting to minimize free acrylonitrile monomer in the copolymer.

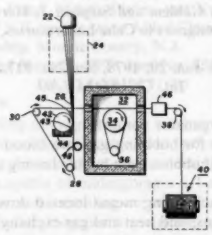
22. In the process for preparing shaped packaging materials from acrylonitrile copolymers, which process involves at least one forming operation comprising heating the polymer to form a melt containing free acrylonitrile monomer and shaping the polymer, the improvement which comprises having linseed oil or safflower oil in intimate contact with the acrylonitrile copolymer during at least one forming operation, said oil being employed in an amount sufficient to reduce the extractable free acrylonitrile monomer contents of the resulting packaging material.

4,228,120

PROCESS FOR NYLON 66 YARN HAVING A SOFT HAND

James E. Bromley, Pensacola, Fla.; Michael M. McNamara, Gaffney, S.C., and Wayne T. Mowe, Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 628,721, Nov. 4, 1975, Pat. No. 4,093,147, which is a continuation-in-part of Ser. No. 482,962, Jun. 25, 1974, abandoned. This application Apr. 21, 1978, Ser. No. 898,746
Int. Cl.[3] B29C *25/00*
U.S. Cl. 264—235.6 **6 Claims**



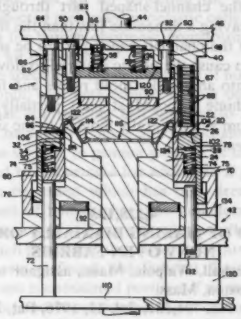
1. A process of melt spinning nylon 66, comprising:
a. extruding nylon 66 polymer of fiber-forming molecular weight as a plurality of molten streams,
b. solidifying said streams into solid filaments while withdrawing said filaments from said streams at a sufficiently high speed to provide a tension within the range between 0.2 and 1.5 grams per final denier;
c. maintaining said filaments under tension within said range while forwarding said filaments at least 0.016 and less than 0.11 seconds after solidification to a treatment zone wherein said filaments are heated to between 50° C. and 250° C. for a period sufficient to reduce the yarn retraction to less than 1%; and
d. withdrawing said filaments from said treatment zone.

4,228,121

METHOD AND APPARATUS FOR FORMING MULTIPLE THICKNESS BEAD

William R. Meadors, Long Grove, Ill., assignor to Peerless Machine & Tool Corporation, Marion, Ind.

Filed Nov. 6, 1978, Ser. No. 957,693
Int. Cl.[2] B29C *1/00, 3/00, 17/03*
U.S. Cl. 264—291 **26 Claims**



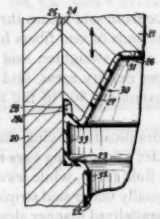
1. A method for forming a bead in an article formed from a blank of flexible material comprising holding a central region of the blank between two cooperating dies, while holding said central region, forming an axially extending flange in the region of the blank between said central region and the perimetral edge of the blank, capturing the perimetral edge against radial movement in a first groove provided in a ring movable with respect to said dies, moving the ring relative to the dies to form the region of the blank between the central region and the perimetral edge into a bead, and moving with respect to said dies and said ring cooperating draw pads provided adjacent said ring, the cooperating draw pads cooperating with the ring and dies to create a void into which the bead is formed, the configuration of the void controlling the formation of the bead.

4,228,122

METHOD OF MANUFACTURING ROLLER CHIMES FOR CLOSED HEAD DRUMS

Theo Hammes, Cologne, Fed. Rep. of Germany, assignor to Mauser Kommandit-Gesellschaft, Bruhl, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,397
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—534 **13 Claims**



1. The method of manufacturing a closed hollow member such as a closed head drum, from a thermoplastic material having spaced end walls and a side wall extending between the end walls, comprising the steps of:
(a) forming a tubular section of thermoplastic material;

(b) closing the ends of the tubular section;

(c) applying a gaseous medium to the interior of the closed tubular section within a mold to blow mold the thermoplastic material outwardly into a hollow shaped member with end walls and a side wall having a projecting annular channel-shaped part with the opening thereto directed toward the interior of the hollow member and the radially outer wall thereof projecting outwardly from the remainder of the side wall of the hollow member; and

(d) pressing the channel-shaped part together and simultaneously squeezing a portion of the thermoplastic material defining the channel-shaped part through a restricted opening having a dimension less than the thickness of the portion of the channel-shaped part to be squeezed therethrough to cause the plastic material to flow through said opening into an annular mold recess and form a molded annular chime disposed at least partially radially outwardly from and integrally molded to the side wall of the hollow member.

4,228,123

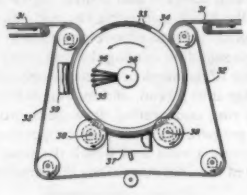
METHOD OF MAKING BIAXIALLY ORIENTED NONWOVEN FABRICS

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Division of Ser. No. 704,582, Jul. 12, 1976, Pat. No. 4,095,007, which is a continuation-in-part of Ser. No. 506,843, Sep. 17, 1974, Pat. No. 3,969,561. This application Feb. 13, 1978, Ser. No. 877,282

Int. Cl.[2] **D04H** *1/64;* **D01G** *15/84;* **264** *89;119;128;286;289*

U.S. Cl. 264—557 **4 Claims**



1. A method of making a biaxially oriented nonwoven fabric having a machine direction to cross direction tensile strength ratio of less than 2 to 1 comprising:

preparing a carded web of textile fibers;

sandwiching said web between a tensioned screen and a set of spaced-apart impervious striping bars in a manner as to have said striping bars exposed to a means for applying fluid force thereon, said striping bars' axis being disposed at approximately 90° to said web's general fiber orientation;

passing a fluid force from said means through said web, said force pushing the ends of said fibers located between said striping bars so as to straighten said fiber portions into resulting low fiber density areas, said fibers being drawn therein at approximately 90° to the axis of said striping bars;

simultaneously hydraulically moving the remaining portion of said fibers under said striping bars into accordian folds by means of said fluid force, while leaving substantially all of the fibers originally under said striping bars to remain in a substantially parallelized manner along the length of said striping bars;

removing said thusly treated web from said screen and striping bars;

binding said web so as to fix the fiber orientation of said web; and

collecting said thusly finished web.

4,228,124

FUMIGATING METHOD AND APPARATUS

Takanobu Kashihara; Fukuyasu Okuda; Masanaga Yamaguchi, and Akira Nishimura, all of Ako, Japan, assignors to Earth Chemical Company, Ako, Japan

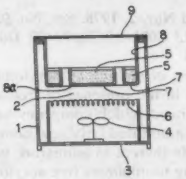
Continuation-in-part of Ser. No. 882,816, Mar. 2, 1978, Pat. No. 4,171,340. This application May 25, 1979, Ser. No. 42,424

Claims priority, application Japan, Feb. 27, 1979, 54-23237

The portion of the term of this patent subsequent to Jul. 31, 1996, has been disclaimed.

Int. Cl.[3] **A61L** *2/20;* **A01M** *13/00*

U.S. Cl. 422—36 **25 Claims**



1. A fumigating method comprising heating a mixture of an active ingredient and a blowing agent with a hot air current to thermally decompose the blowing agent without entailing combustion and cause the hot air current and the gas resulting from the thermal decomposition to vaporize and diffuse the active ingredient, the blowing agent being decomposable at a temperature of about 70° C. to about 300° C. to mainly evolve nitrogen gas and contacting an object, material or an area to be treated with the so-generated fumigant.

10. A fumigating apparatus comprising a container having a passage for forcing a hot air current therethrough, the passage being provided therein with a fan for forcing the hot air current and with a mixture of an active ingredient vaporizable and diffusable when heated with the hot air current and a blowing agent thermally decomposable when heated with the hot air current to promote the vaporization and diffusion of the active ingredient, said blowing agent being decomposable at a temperature of about 70° C. to about 300° C. to give off mainly nitrogen gas.

4,228,125

GAS EXCHANGE APPARATUS

Donn D. Lobdell, Golden, and Stephen J. Herman, Evergreen, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 20, 1978, Ser. No. 917,350

Int. Cl.[2] **A61M** *1/03*

U.S. Cl. 422—46 **10 Claims**

1. A blood oxygenator comprising

foaming means for bubbling gas into blood to form a foam composed of bubbles, each bubble having a wall formed of said blood,

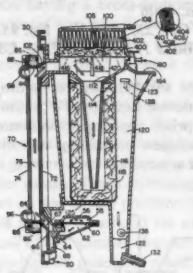
heat and gas exchanging means located downstream of said foaming means, said heat and gas exchanging means comprising

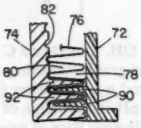
a heat-conductive corrugated sheet having first and second opposing surfaces,

a housing adjacent said first opposing surface and defining therebetween a chamber for passing heat-transfer fluid along said first surface, said housing having an inlet for connection to a heat-transfer fluid source and an outlet for removing said heat-transfer fluid from said chamber, the flow through said chamber being isolated from said second opposing surface, and

a wall surface adjacent to said second opposing surface, said wall surface and said second surface defining a plurality of passages corresponding to the corrugations in said sheet, said passages distributing said foam into a corresponding

plurality of streams and providing locations for simultaneous
heat transfer between said fluid and said foam and





gas transfer between said gas and said blood at the walls of said bubbles, and
defoaming means located downstream of said heat and gas exchanging means for breaking up said bubbles.

4,228,126

DIACETYLENE TIME-TEMPERATURE INDICATORS

Gordhanbhai N. Patel, Morris Plains, and Kwok C. Yee, Randolph, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 25, 1977, Ser. No. 854,933
Int. Cl.[2] G01N *21/06*
U.S. Cl. 422—56 **8 Claims**

1. In a recording device including a substrate having deposited thereon at least one indicator, said indicator comprised of at least one acetylenic compound, containing two conjugated C≡C groups, capable of undergoing a 1,4-addition polymerization upon thermal annealing or exposure to actinic radiation, thereby undergoing an irreversible, progressive color change, wherein the color produced at any time during the color change represents an integrated time-temperature history of thermal annealing or integrated radiation-dosage history of exposure to actinic radiation, the improvement which comprises said acetylenic compound in an inactive form, positioned for exposure to the conditions to be recorded and capable of in situ conversion, by melt or solvent recrystallization, to an active form capable of undergoing 1,4-addition polymerization; wherein said active and inactive forms exhibit different X-ray crystallographic diffraction patterns, and said inactive form being incapable of undergoing 1,4-addition polymerization upon exposure to gamma radiation at room temperature or thermal annealing below its melting point.

4,228,127

KIT FOR DETECTING HUMAN CHORIONIC GONADOTROPIN

Hernan F. Acevedo, Allison Park; Malcolm Slifkin, Pittsburgh, and Milton H. Dalbow, Springdale, all of Pa., assignors to International Radioimmune Systems, Inc., Howell, Mich.

Division of Ser. No. 677,992, Apr. 19, 1976, Pat. No. 4,144,031.
This application Oct. 6, 1978, Ser. No. 949,330
The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.
Int. Cl.[2] G01N *33/16, 31/14*
U.S. Cl. 422—61 **1 Claim**

1. A diagnostic test kit for detecting the absence or the presence of suspected malignant neoplastic cells in a cell specimen by testing for human chorionic gonadotropin, said diagnostic cell test kit comprising:

(a) antiserum specific to the beta-subunit of human chorionic gonadotropin, said beta-subunit having been raised in a host animal, for treating cell samples to be tested, followed by rinsing to remove any excess antiserum;

(b) antiserum specific to gamma globulin of said host animal conjugated to fluorescein for adding to a portion of said sample to be tested which has been treated with said beta-subunit of human chorionic gonadotropin followed by examination of said portion with an ultraviolet microscope which passes the ultraviolet light through said cells; if fluorescein is found, the indirect fluorescein-labelled antibody test is considered positive; if no staining is found, this indirect test is considered negative; and

(c) antiserum specific to said gamma globulin of said host animal conjugated to peroxidase for adding to a second portion of said cell specimen treated with said antiserum specific to the beta-subunit of human chorionic gonadotropin and peroxidase activator, added to said second cell sample followed by an examination of said second portion with a microscope to determine whether peroxidase staining has occurred, the indirect peroxidase-labelled antibody test is considered positive if staining is found; if no staining is found, the test is negative;

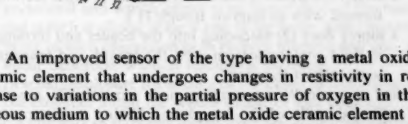
the cell test for human chorionic gonadotropin is then considered positive only if both indirect labelled antibody tests are positive; if both indirect antibody tests are negative or if one indirect labelled antibody test is positive and the other is negative, the diagnostic cell test is negative for human chorionic gonadotropin, establishing that neoplastic cells are not present in the cells tested.

4,228,128

EXHAUST GAS SENSOR HAVING POROUS, METAL-IMPREGNATED CERAMIC ELEMENT

Michael J. Esper, Redford Township, Wayne County; Wells L. Green, and Stanley R. Merchant, both of Garden City, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 839,701, Oct. 5, 1977, abandoned. This application Mar. 19, 1979, Ser. No. 21,374
Int. Cl.[3] G01N *27/12*
U.S. Cl. 422—98 **5 Claims**



1. An improved sensor of the type having a metal oxide ceramic element that undergoes changes in resistivity in response to variations in the partial pressure of oxygen in the gaseous medium to which the metal oxide ceramic element is exposed, the metal oxide ceramic element having electrodes in spaced apart relationship, the electrodes extending from the

metal oxide ceramic element to permit the resistance between them to be sensed, and the metal oxide ceramic element being adapted to be immersed in the gaseous medium, wherein the improvement comprises:

the metal oxide ceramic element is titania (TiO_2) and is porous to enlarge, as compared to a less porous material, the amount of titania element surface area exposed to the gaseous medium, and the titania element surface area has on it, and substantially throughout the volume of the titania ceramic element, a discontinuous charge transfer material comprising a metal having free electrons, whereby, the response time of the titania ceramic element is substantially reduced due to the presence of the charge transfer material, in the lower portion of the temperature range over which the titania ceramic element responds to variations in the partial pressure of oxygen in the gaseous medium;

the sensor includes a second ceramic element less responsive to variations in the partial pressure of oxygen in the gaseous medium that is the first-mentioned ceramic element, and includes means for electrically connecting the first-mentioned ceramic element and second ceramic element in circuit such that output voltage changes from 33% to 66%, and vice versa, of applied voltage occur in less than about 300 milliseconds when the ceramic elements are at a temperature of about 350° C.

4,228,129

CLEANING ATTACHMENT TO CLEAN FLASK-SHAPED RECEIVERS OF CHEMICAL ANALYSIS APPARATUS

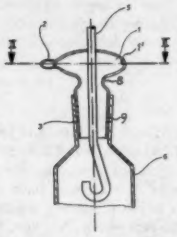
Rolf Brüning, Bruchköbel, and Jürgen Roth, Maintal, both of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Fed. Rep. of Germany

Filed Jun. 20, 1979, Ser. No. 50,317

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1978, 2832348

Int. Cl.[3] **B01L** *3/00;* **B08B** *3/08, 9/08*

U.S. Cl. 422—102 **10 Claims**



1. In combination with chemical analysis apparatus including a flask-shaped receiver (**6**) having a conically divergent upper mouth (**3**),

a cleaning attachment for removable association with said receiver to clean the receiver without disassociating said receiver from the apparatus,

said attachment comprising,

a header (**1**) which is essentially circular in cross section and formed with an interior trough (**1'**);

a supply duct (**2**) extending into the header and terminating in fluid communication with the trough and tangentially with respect thereto;

and a conically converging neck portion (**3**) positioned downwardly of the trough and having an outer surface matching the conically divergent upper mouth of the flask-shaped receiver for accurate and tight fit thereinto.

4,228,130

COATING POLYMERIZATION REACTORS WITH OLIGOMERS DERIVED FROM POLYHYDRIC PHENOLS PLUS A BLEACH

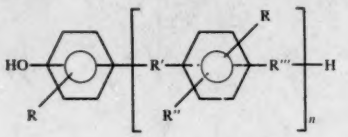
Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 23, 1978, Ser. No. 953,989

Int. Cl.[3] **B01J** *1/20;* **B05D** *7/22;* **C08F** *2/00*

U.S. Cl. 422—131 **12 Claims**

1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces an aqueous alkaline coating solution containing one or more oligomers having the general structure



wherein R is H or OH, R' is O or a C—C linkage, R'' is Cl, R''' is selected from the group consisting of O, a C—C linkage, and a C—H linkage, and n is an integer from 1 to 10, said coating solution having a pH in the range of about 8 to about 13, and conducting the polymerization of monomer(s) at a temperature in the range of about 0° C. to about 100° C. while in contact with the coated internal surfaces of said vessel.

4,228,131

APPARATUS FOR THE PRODUCTION OF CARBON BLACK

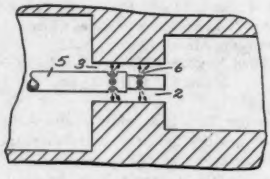
Lothar Rothbühr, Hermulheim, and Manfred Voll, Hanau, both of Fed. Rep. of Germany, assignors to Deutsche Gold-Und Silber-Scheideanstalt Vormal Roessler, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 824,842, Aug. 15, 1977, abandoned, which is a division of Ser. No. 699,973, Jun. 25, 1976, Pat. No. 4,179,494. This application Mar. 6, 1977, Ser. No. 17,976

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1975, 2530371

Int. Cl.[3] **C09C** *1/50*

U.S. Cl. 422—156 **5 Claims**



1. An apparatus for the production of carbon black comprising, in combination, means defining a combustion chamber for the combustion of a fuel gas with an oxygen containing gas, said combustion chamber having a central axis, first conduit means for introducing fuel gas radially from a hollow shell into said combustion chamber with said conduit means extending along said central axis, second conduit for introducing an oxygen containing gas tangentially into said combustion chamber, means defining a mixing chamber connected to said combustion chamber and greatly constricted compared to said combustion chamber, means defining a reaction chamber connected to said mixing chamber, said reaction chamber being enlarged compared to said mixing chamber, each of said chambers being aligned along a common middle axis, a carbon black forming material atomizing apparatus including a cylindrical

conduit having outlet means for directing the carbon black forming material radially from within outwardly of said conduit, said cylindrical conduit having a first portion having a selected cross-sectional area and a second portion downstream of said first portion having a cross-sectional area that is less than said cross-sectional area of said first portion, said atomizing apparatus being positioned within the mixing chambers so as to define an annular channel between the exterior of said conduit along said first portion and the wall of said mixing chamber, said mixing chamber having said second portion of said conduit disposed therein along the remaining length of said mixing chamber with said remaining length of said mixing chamber having a greater cross-sectional area than said annular channel, said outlet means of said atomizing apparatus including a set of nozzles on one of said portions of said conduit with the nozzles of said set spaced around the exterior of said conduit, the dimensions of said annular channel being such that the velocity of the combustion gases will reach approximately 400 meters per second, the transition from said combustion chamber to said mixing chamber being stepwise in cross-section.

4,228,132

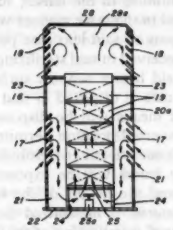
HYDROGEN-OXYGEN RECOMBINER

Sterling J. Weems, Chevy Chase, Md., and Harold W. McCurdy, Jr., Vienna, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 686,437, May 14, 1976, Pat. No. 4,139,603, which is a continuation of Ser. No. 387,418, Aug. 10, 1973, abandoned. This application Feb. 17, 1978, Ser. No. 878,850

Int. Cl.[2] G21C *9/00;* **C01B** *5/00*

U.S. Cl. 422—174 **4 Claims**



1. A hydrogen-oxygen recombiner for use in a nuclear reactor system to combine hydrogen gas and oxygen gas thereby forming water vapor without the use of a catalyst or a spark device comprising:

a frame defining an inlet zone and a recombination zone for directing a fluid including hydrogen gas and oxygen gas into said inlet zone where said fluid is preheated to about 250° F. thereby drying said fluid as said fluid passes therethrough and thus preventing corrosive damage to said apparatus; and

a plurality of electric heating elements disposed in said recombination zone with the power density of each succeeding electrical heating element being less than the preceding one for heating said fluid to a temperature of about 1150° to 1400° F. to thereby combine the hydrogen gas and oxygen gas into water vapor.

4,228,133

APPARATUS FOR SULFATIZING ROASTING OF A FINELY-DIVIDED SELENIUM-BEARING RAW MATERIAL

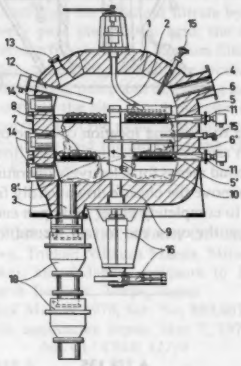
Leo E. Lindroos; Ahti E. Turpeinen, both of Pori, and Aarne A. Kapanen, Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Feb. 23, 1979, Ser. No. 14,433

Claims priority, application Finland, Feb. 24, 1978, 780628

Int. Cl.[2] B01J *3/04;* **F27B** *9/16*

U.S. Cl. 422—195 **5 Claims**



1. An apparatus for the sulfatizing roasting of selenium-containing raw material, especially anode slime from copper electrolysis, with sulfuric acid at a raised temperature, the apparatus comprising: a furnace chamber having an inlet for a slurry of finely-divided, selenium-containing raw material and sulfuric acid, an outlet for withdrawing roasted solid from the furnace chamber, an outlet for discharging selenium-bearing gases produced during the sulfatizing roasting, means for heating the slurry in the furnace chamber, and at least one combination of a tray supporting the slurry and a scraper scraping the tray for transferring, as a layer, the slurry fed into the furnace chamber from the slurry inlet towards the outlet for solid, at least some of the slurry-heating means being mounted in one tray in order to heat it, wherein the slurry inlet is a pipe bent to the side at its lower end and fitted through the top of the furnace chamber and concentrically rotatable with the trays or scrapers in order to distribute the slurry onto a topmost tray.

4,228,134

AUTOCLAVE FOR THERMALLY TREATING VERY LONG RUBBERY HOSE PRODUCTS, AND THE LIKE

Deregibus Alfio, Padova, Italy, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 13, 1977, Ser. No. 841,788

Claims priority, application Italy, Apr. 5, 1977, 23161 A/77

Int. Cl.[2] B01J *3/04;* **A61L** *3/00*

U.S. Cl. 422—208 **6 Claims**

1. An autoclave, for the curing by heat and pressure treatment of rubber hose mounted on a core comprising:

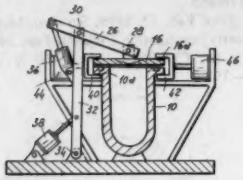
(i) a very elongated body of U-shaped transverse cross-section and defining a linear trough-shaped chamber which is horizontal and which opens at an upper face of the body and which is closed at each end of the body, said chamber being of such elongation as to receive the hose and core in linear condition without folding or doubling,

(ii) a separate closure for sealing of the upper face opening of the chamber along the whole extent of said opening,

(iii) a plurality of movable means disposed at intervals alongside said body for movement in a direction transverse to its length and vertically downward toward said open end,

(iv) means suspending said closure from said movable means to lie in a horizontal plane,

(v) first means for operating said movable means to selectively move the closure from a first location offset laterally from the body in a transverse direction toward said



body and to a second location over the open end thereof and from said second location to said first location,

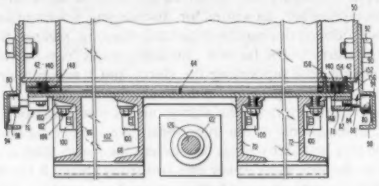
(vi) and second means for selectively operating said movable means to move the closure downwardly from said second location to completely cover said open end and upwardly away from the open end to said second location.

4,228,135

DOOR AND SEAL CONSTRUCTION FOR STERILIZERS

Robert Wolff, Mantoloking, N.J., assignor to Better Built Machinery Corporation, Saddle Brook, N.J.

Filed Sep. 9, 1977, Ser. No. 831,768
Int. Cl.[2] A61L 3/00; E06B 7/22
U.S. Cl. 422—296 **5 Claims**



1. A sterilizer construction comprising:

(a) an enclosure defining an access opening;

(b) a rigid door having dimensions slightly greater than said access opening;

(c) roller members mounted on opposite sides of said door;

(d) elongated guide track means mounted opposite the sides of said access opening;

(e) said rollers being movably mounted in said guide track means;

(f) means to restrain said door from displacement under pressure of fluid in said enclosure, said means consisting of restraining means extending substantially along two parallel edges of said door and enclosure;

(g) a plurality of stacked cover plates forming a channel surrounding said access opening;

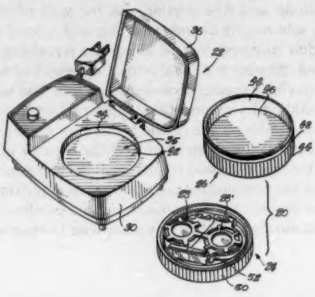
(h) a sealing means comprising two discrete components in said channel, the first of said components being hollow and expandable when provided with fluid under pressure from a suitable source of supply, the second of said components overlying said first-named component and comprising a pair of flanges and an engaging seal portion which engages the inner surface of said door when said first-named component is expanded, said flanges being sandwiched between said plates.

4,228,136

LENS HOLDER AND STERILIZER

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Hanover Park, Ill.

Filed Feb. 14, 1978, Ser. No. 877,671
Int. Cl.[2] A61L 3/00; B05D 81/24
U.S. Cl. 422—307 **14 Claims**



1. A generally flat, horizontally elongate lens case for housing a pair of contact lenses in side-by-side relation and adapted for use with a sterilizer unit including a heating well for receiving the case and a heater support surface upon which the lens case will rest, said lens case comprising a base section and a cover section, means on said base and cover sections for affixing one to the other to define the assembled condition for said case and provide an enclosed space for a sterilizing solution, said base section including separate, side-by-side lens support arrangements, each for receiving one of a pair of lenses, each said lens support arrangement including a convex support surface facing outwardly of said base section and adapted to have a lens supported thereon with the concave surface of the lens engaging said convex support surface, and a concave cover member adapted to overlie said convex support surface in spaced relation thereto to retain a lens therebetween, said cover members including aperture means for permitting the flow of sterilizing solution to the lenses, such that both said lenses will be oriented in the same manner with respect to said base section, and means on said lens case permitting only said cover section to be received in said sterilizing unit heating well and engaged with said heater support surface, thus insuring that when said lens case is disposed in said heating well, the contact lens support means will be disposed in an inverted position, with said inverted position permitting said lenses to be supported on the concave cover members, so that the concave surfaces of the lenses will be exposed directly to the sterilizing solution, and the length of the heat transfer path through the case material is maximized thereby to prevent against the possibility of overheating of the lenses.

4,228,137

METHOD OF PRODUCING FAUJASITE ZEOLITES EMPLOYING SEEDING TECHNIQUES

Dennis R. Taylor, Covina, and Mark Jones, Anaheim, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Oct. 18, 1979, Ser. No. 85,851
Int. Cl.[3] C01B 33/28
U.S. Cl. 423—118 **12 Claims**

1. The process of producing a faujasite zeolite having a SiO_2/Al_2O_3 molar ratio in excess of three (3) which comprises digesting, at a relatively low temperature, a water mixture of natural crystalline halloysite as a source of aluminum and silicon and a source of sodium and forming seed in a mother liquor; forming a hot soak composed of a mixture in water of a source of aluminum, silicon and sodium including said seeds and digesting said hot soak at a higher temperature than said

relatively low temperature, and forming said zeolite, in a mother liquor, separating said zeolite from said last named mother liquor, the Na_2O/SiO_2 molar ratio in said cold soak being substantially in excess of the Na_2O/SiO_2 ratio in the hot soak and the H_2O/Na_2O ratio in the cold soak being substantially less than in the said hot soak.

4,228,138

CATALYSIS

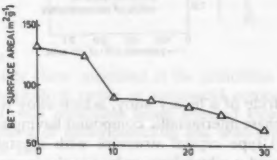
Paul A. Sermon, Cowley, England, assignor to Johnson, Matthey & Co., Limited, London, England

Continuation-in-part of Ser. No. 740,172, Nov. 9, 1976, Pat. No. 4,088,604, which is a continuation of Ser. No. 553,308, Feb. 26, 1975, abandoned. This application Jan. 25, 1978, Ser. No. 872,589

Claims priority, application United Kingdom, Mar. 6, 1974, 10063/74

Int. Cl.² B01D *53/34*

U.S. Cl. 423—239 **10 Claims**



BET surface area as a function of cobalt-iron oxide composition (hydroxide preparation)

1. A process for decomposing NO in air or other gaseous media containing the oxide which includes the step of contacting said air or other gaseous media with a supported catalyst comprising a mixed oxide selected from the group consisting of:

(a) $Co_x^{II}Fe_{1-x}^{II}Fe_2^{III}O_4$ where x normally has values greater than 0 and up to 1 and,

(b) $Co^{II}Co^{III}_{(x-1)}Fe^{III}_{(3-x)}O_4$ where x normally has values $1 \leqq x \leqq 3$,

the catalyst support being a corrugated or extended metallic substrate or nichrome wire having deposited thereon a first layer, 0.0004 to 0.001 inch thick, comprising an adherent alumina coating.

4,228,139

FLUE GAS SCRUBBING PROCESS USING FLY ASH ALKALI

Carlton A. Johnson, Old Tappan, N.J., assignor to Peabody Process System, Inc., Stamford, Conn.

Filed Mar. 6, 1979, Ser. No. 18,291

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **9 Claims**

1. The process of utilizing fly ash for the removal of sulfur dioxide from flue gas comprising the steps of

A. acid leaching fly ash to provide a high ionic strength scrubber slurry;

B. contacting the flue gas with said scrubber slurry at a pH of less than about 4; and

C. maintaining the ionic concentration of the scrubber slurry at a concentration at over about 5,000 ppm by recycling the scrubber slurry supernatant in a closed loop, water balanced system comprising a waste reservoir with an inlet conduit for scrubber slurry and solids and a return conduit for scrubber slurry supernatant, said waste reservoir having a relatively small volume to retain high ionic concentration of the scrubber slurry supernatant which is returned to recontact the flue gas.

4,228,140

PRODUCTION OF PHOSPHATES

Stephen J. King, Clearwater, Fla., assignor to The Nash Engineering Company, Norwalk, Conn.

Filed Jun. 13, 1977, Ser. No. 806,391

Int. Cl.² C01B *25/16*

U.S. Cl. 423—320 **14 Claims**

1. In a method of producing phosphoric acid which includes subjecting a phosphate bearing rock to attack by sulfuric acid to produce a slurry of phosphoric acid and by-products, cooling the slurry by evaporation, filtering the resultant cooled slurry, and concentrating the resultant filtrate by evaporation to obtain relatively pure phosphoric acid, the improvement comprising delivering filtrate from a vacuum filter to a filtrate receiving chamber, connecting said filtrate receiving chamber to the inlet of a liquid ring pump and delivering sulfuric acid to the pump to constitute the ring liquid therefor in concentrations such that corrosion of the pump is minimized and operating said pump to cause said filtrate receiving chamber to be subject to a low pressure.

4,228,141

PROCESS FOR A GASIFICATION OF GRAPHITE

Susumu Sugikawa, Tohkai; Mitsuru Maeda, Mito, and Takeshi Tsujino, Tohkai, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,801

Claims priority, application Japan, Mar. 7, 1977, 52-24601

Int. Cl.² C01B *31/18*

U.S. Cl. 423—415 A **8 Claims**

1. A process for gasification of graphite blocks comprising soaking the graphite block in a solution comprising a nitrate of a gasification catalyst selected from the group consisting of iron, cobalt or nickel and nitric acid at temperatures of from 20°–90° C. to impregnate the graphite block with the gasification. catalyst and then contacting the catalysts-containing graphite block with carbon dioxide at a temperature above 1000° C. and gasifying said graphite.

4,228,142

PROCESS FOR PRODUCING DIAMOND-LIKE CARBON

Cressie E. Holcombe, Jr., 1613 Blackwood Dr., Knoxville, Tenn. 37919; James B. Condon, 511 Robertsville Rd., and D. H. Johnson, 113 Morgan Rd., both of Oak Ridge, Tenn. 37830

Filed Aug. 31, 1979, Ser. No. 71,778

Int. Cl.² C01B *31/02*

U.S. Cl. 423—449 **24 Claims**

1. A process for producing metastable carbon phases which comprises reacting a fluorocarbon with silicon carbide or a precursor of silicon carbide at a temperature of above about 800° C.

7. A process for producing metastable carbon phases which comprises reacting silicon carbide and carbon tetrafluoride at a temperature between about 800° and 1200° C.

4,228,143

METHOD OF PRODUCING PELLETED CARBON BLACK

Paul J. Cheng, and King L. Mills, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 22, 1978, Ser. No. 880,243

Int. Cl.² C01B *31/00, 31/02*; C09C *1/56*

U.S. Cl. 423—445 **2 Claims**

1. A method of producing pelleted carbon black to reduce modulus loss comprising:

providing flocculent carbon black having a toluene photelometer of between about 45 and 65 or a chloroform photelometer of between about 78 and about 90, an N_2SA-CTAB value of less than about 10 m^2/gm, an N_2SA-I_2 adsorption number of between about 6 and about 20, and a nitrogen surface area of between about 75 m^2/gm and about 140 m^2/gm;

pelleting said flocculent carbon black using an aqueous

pelleting liquid substantially free of additives to form carbon black pellets;

drying said carbon black pellets at a temperature of less than about 300° F. in an environment containing less than about 8 volume percent free oxygen; and

recovering the thus dried pellets.

4,228,144

PROCESS FOR THE PREPARATION OF ANHYDROUS MAGNESIUM CHLORIDE HAVING A HIGH DEGREE OF PURITY

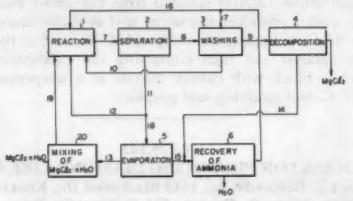
Hisashi Kono; Kenji Terai; Takazumi Niwa; Katsumi Uemura, all of Ube, and Tetsuya Oda, Onoda, all of Japan, assignors to Ube Industries Ltd., Yamaguchi, Japan

Filed Feb. 16, 1979, Ser. No. 12,877

Claims priority, application Japan, Feb. 22, 1978, 53/18578

Int. Cl.³ C01F *5/30, 5/34*

U.S. Cl. 423—498 **12 Claims**



1. A process for the preparation of anhydrous magnesium chloride, which comprises the steps of:

reacting magnesium chloride with ammonia in the presence of ammonium chloride in an aqueous medium at a temperature of from −30° to 0° C. while allowing the resultant magnesium chloride hexammoniate to precipitate from the reaction mixture;

separating an aqueous solution containing unreacted magnesium chloride ammonia, and ammonium chloride from said precipitated magnesium chloride hexammoniate at a temperature of from −50° to 0° C;

washing said magnesium chloride hexammoniate with liquid ammonia at a temperature of −30° C. or lower;

decomposing said washed magnesium chloride hexammoniate into anhydrous magnesium chloride and gaseous ammonia at a temperature of from 270° to 400° C.;

isolating said anhydrous magnesium chloride from said decomposition mixture, and

which is characterized in that a portion of said separated aqueous solution is subjected to evaporation at a temperature of from 80° to 100° C. under an ambient pressure whereby aqueous ammonia solution is removed to such an extent that the residual liquid of said evaporation contains 2.5% by weight or less of ammonia:

mixing said residual liquid with fresh magnesium chloride and feeding said mixture into said reacting step, and

directly recycling the remaining portion of said separated aqueous solution into said reacting step.

4,228,145

HYDROGEN STORAGE MATERIAL

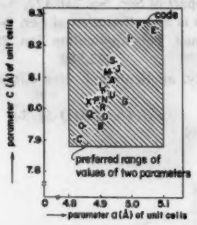
Takaharu Gamo, Fujiidera; Yoshio Moriwaki, Moriguchi; Toshio Yamashita, Katano, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 760,421, Jan. 18, 1977, Pat. No. 4,153,484. This application Oct. 20, 1978, Ser. No. 953,251

Claims priority, application Japan, Apr. 14, 1976, 51-42841; Apr. 14, 1976, 51-42842; Jan. 20, 1976, 51-5632; Jan. 20, 1976, 51-5635

Int. Cl.² C01B *6/00*

U.S. Cl. 423—644 **24 Claims**



1. The hydride of a binary alloy, which alloy is a substantially Laves phase intermetallic compound having a hexagonal $MgZn_2$ (C14) type crystal structure with crystal structure parameters a and c which have values in the range:

$a = 4.80 \sim 5.10$ angstroms,

$c = 7.88 \sim 8.28$ angstroms.

4,228,146

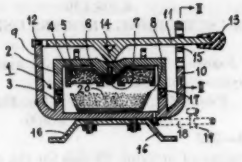
METHOD OF PRODUCING RADIOACTIVE CARBON POWDER

Yuzo Imamura, No. 558 Junicho, Ibusuki, Kagoshima, Japan

Continuation-in-part of Ser. No. 846,501, Oct. 27, 1977, abandoned. This application Oct. 27, 1978, Ser. No. 955,164

Int. Cl.² A61K *43/00*

U.S. Cl. 424—1 **1 Claim**



1. A method for the production of radioactive carbon powder with radon gas absorbed therein and capable of radiating alpha-rays using an apparatus comprising a receptacle with a removable lid capable of being closed in an airtight fashion and with means to extract air from the receptacle, comprising:

affixing grains of radium ore contained in a bonding agent to the inside of the lid;

placing preheated carbon powder into the receptacle;

spraying water on the radium grains;

pressing the lid against the receptacle, before the powder is cooled, to make the receptacle airtight; and

extracting air from the airtight receptacle.

4,228,147

COMPOSITION AND METHOD FOR TESTING TO PREDICT AND/OR DIAGNOSE ALLERGY TO PENICILLINS

Bernard B. Levine, 210 Riverside Dr., New York, N.Y. 10025

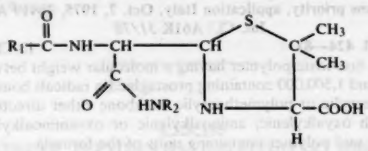
Division of Ser. No. 898,044, Apr. 20, 1978. This application May 9, 1979, Ser. No. 37,248

Int. Cl.[2] **A61K** *29/00, 31/43*

U.S. Cl. 424—9 **4 Claims**

1. A composition for skin testing for allergy or hypersensitivity to penicillins, including benzyl penicillin and semi-synthetic penicillins, by the detection of minor determinant-specific skin sensitizing antibodies, by prick, scratch or intradermal testing of the skin of a patient comprising

(1) a compound represented by the formula:



wherein:

R_1 is a side chain contained in the penicillins from which the penicilloyl amine or aminoacid compound is prepared; said penicillins being selected from the group consisting of benzylpenicillin and semi-synthetic penicillins, and

R_2 is a substituent selected from the group consisting of an alkyl group of C_2–C_6 chain length, a carboxy alkyl group of C_2–C_6 chain length, an aminoacid group and an amine group of the type present in the blood, blood plasma or tissue fluids, said amine group and aminoacid group being derived from compounds selected from the group consisting of cystamine, spermine, spermidine, phosphoethanolamine, arginine, cystine, glutamine, histidine, lysine, proline, serine, threonine, and asparagine,

said compounds represented by said formula being α-diastereoisomers or diastereoisomeric mixtures;

(2) benzylpenicillin;

(3) sodium benzylpenicilloate; and

(4) a suitable solvent for said compounds (1), (2) and (3), said solvent being compatible with the use of said composition in skin testing for penicillin allergy or hypersensitivity to penicillins, including benzyl penicillin and semi-synthetic penicillins,

the concentration of said compounds (1), (2) and (3) in said solvent (4) being sufficient to elicit a wheal and flare response in patients allergic or potentially allergic to said penicillins when said composition is administered to said patient in said skin testing but said concentration being optimal to avoid a constitutional reaction.

4,228,148

HETEROPHIL ANTIBODY DIFFERENTIATION (HAD) TEST

Joseph Zichis, deceased, late of Rancho Sante Fe, Calif., and Lillian K. Zichis, executrix, P.O. Box 48, Rancho Sante Fe, Calif. 92067

Division of Ser. No. 689,308, May 24, 1976, Pat. No. 4,139,606. This application Jan. 22, 1979, Ser. No. 5,497

Int. Cl.[2] **G01N** *31/00, 33/16;* **A61K** *35/18*

U.S. Cl. 424—12 **1 Claim**

1. The heterophil antibody differentiation test comprising the steps of:

placing at spaced areas on a slide three samples of blood, plasma or serum suspected of containing infectious mononucleosis heterophil antibody;

adding to the first sample an aliquot of infectious mononucleosis antibody neutralizing antigen, MN, composition prepared by heating heavily lysed beef erythrocytes dispersed in water to about 95° C. and maintaining the same at that temperature for about one-half hour, separating the solids from the mixture resulting from the preceding step, adjusting the pH of the supernatant solution to about pH 7 with acid or basic potassium phosphate, adding zinc sulphate to the solution to precipitate the MN antigen, separating the precipitated MN antigen from the supernatant solution and dispersing the antigen in a phosphate buffer solution;

adding to the second sample an aliquote of Forssman antibody neutralizing antigen, FN, composition prepared by storing commminuted guinea pig or horse kidney tissue in saline solution containing NaN_3 at from about 2° to 4° C. for about 24 hours, heating the resulting suspension to about 95° C. and maintaining it at that temperature for about one-half hour, separating the solids from the supernatant liquid and cooling the liquid to about 25° C., adjusting the pH of the cooled supernatant liquid to about pH 7 with acid or basic potassium phosphate, precipitating the FN antigen from the solution by the addition of zinc sulphate, separating the precipitated FN antigen from the supernatant solution and dispersing the antigen in a phosphate buffer solution;

adding to each of said samples an aliquot of heterophil antibody reactive antigen, HA, composition resulting from incubating horse, mule or sheep blood in aqueous solution of KH_2PO_4, Tris and NaN_3 at about pH 7 for about 3 to about 6 days at a temperature of not more than about 36° C., separating the antigen from blood hemoglobin and proteins, and dispersing the antigen in a solution of KH_2PO_4, K_2HPO_4, NaN_3 and glucose; and

observing each of said sample mixtures for agglutination, in the case of a positive test for infectious mononucleosis there being no agglutination in the first sample mixture and there being agglutination in the second and third sample mixtures.

4,228,149

SUSTAINED RELEASE COMPOSITIONS

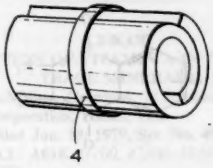
Malcolm D. Brewer, Northgate Crawley, and Gerald J. L. Griffin, London, both of England, assignors to Beecham Group Limited, England

Filed May 30, 1978, Ser. No. 910,278

Claims priority, application United Kingdom, Jun. 9, 1977, 24178/77

Int. Cl.[2] **A61K** *9/20, 9/24*

U.S. Cl. 424—14 **24 Claims**



4

1. A device adapted for administration to ruminants comprising a water soluble veterinary medicament dispersed in a resilient sheet of water insoluble ethylene-vinyl acetate copolymer, said medicament being present in an amount corresponding to 30 to 75% by weight of said sheet, said copolymer sheet being of a size and composition such that it is capable of being constrained by constraining means in a rolled-up configuration which permits oral administration, said constraining means being operable to release said constrained sheet in the rumen environment, said sheet when unconstrained thereby

assuming an unrolled configuration favoring retention thereof in the rumen.

4,228,150

METHOD OF INHIBITING DEXTRANSUCRASE AND ORAL COMPOSITIONS FOR USE THEREIN

John F. Robyt, and John N. Zikopoulos, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Apr. 23, 1979, Ser. No. 32,398
Int. Cl.[2] A61K *9/68, 7/18, 31/70*
U.S. Cl. 424—48 **26 Claims**

1. The method of inhibiting dextransucrase synthesis of dextran from sucrose, comprising introducing into an aqueous substrate containing sucrose and dextransucrase an inhibitory amount of at least one fluorosucrose which has been substituted at least at the 6-position with a fluorine atom for the hydroxyl group.

4,228,151

COSMETIC COMPOSITION FOR IMPARTING TO HUMAN SKIN A COLORATION RESEMBLING A NATURAL TAN

Gerard Lang, Epinay-sur-Seine, and Serge Forestier, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Filed May 3, 1977, Ser. No. 793,317
Claims priority, application France, May 3, 1976, 76 13165
Int. Cl.[3] A61K *7/42, 7/44, 7/021, 31/495*
U.S. Cl. 424—60 **19 Claims**

1. A process for coloring human skin comprising applying to the skin in an amount sufficient to impart to said skin after exposure to ultraviolet rays a coloration resembling a natural tan a composition comprising a cosmetic vehicle suitable for topical application to the skin selected from the group consisting of

(1) a hydroalcoholic solution containing 10–90 weight percent alcohol,

(2) a glycerin-alcoholic solution containing 10–90 weight percent alcohol,

(3) a glycerin-hydroalcoholic solution containing 10–90 weight percent alcohol,

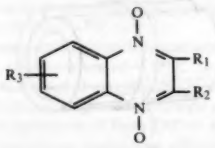
(4) an oleo-alcohol composition containing a vegetable oil, a lower alkyl ester and a lower alcohol having 1–4 carbon atoms,

(5) an aqueous gel including a surfactant and a gel forming agent, and

(6) an oil-in-water emulsion including a surfactant, an oil, a thickening agent and a humectant,

and at least one compound selected from the group consisting of

(a) a compound of the formula



wherein R_1 and R_2 each independently represent hydrogen, a linear or branched alkyl having 1–18 carbon atoms, carbalkoxy having 2–5 carbon atoms, acyl having 2–5 carbon atoms, phenyl and phenyl substituted by a member selected from the group consisting of alkyl having 1–4 carbon atoms and hydroxy, and

R_3 represents hydrogen, lower alkyl containing 1–6 carbon atoms, lower alkoxy containing 1–4 carbon atoms or halogen,

with the proviso that R_1, R_2 and R_3 are not hydrogen simultaneously; and

(b) an acid addition salt of the compound in (a),

said compound being present in an amount of 0.5–10 percent by weight of said composition, and said composition having a pH between 3 and 8.5, and

exposing the skin to ultraviolet rays for a time effective to develop said color on said skin.

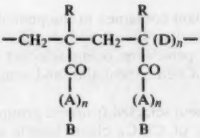
4,228,152

POLYMERS CONTAINING PROSTAGLANDIN RADICALS, PROCESS FOR THEIR PREPARATION AND USE THEREOF

Paolo Ferruti, V.le Cassiodora, 24, and Rodolfo Paoletti, V.le Regina Margherita, 43, both of Milan, Italy

Continuation-in-part of Ser. No. 620,401, Oct. 7, 1975, abandoned. This application Nov. 14, 1978, Ser. No. 960,665
Claims priority, application Italy, Oct. 7, 1975, 28419 A/75
Int. Cl.[2] A61K *31/78*
U.S. Cl. 424—81 **13 Claims**

1. A non-toxic polymer having a molecular weight between 1,000 and 1,500,000 containing prostaglandin radicals bound to a polyacrylic or polymethacrylic backbone either directly or through oxyalkylenic, aminoalkylenic or oxyaminoalkylenic chains, said polymer containing units of the formula



wherein R represents H or CH_3, A represents an alkylene radical terminated at both ends with an —NH— or —O— group, n represents 0 or 1 in both occurences, B represents —OPg or —CO—Pg wherein Pg represents a prostaglandin residue, and D represents a divalent radical supplied by a comonomer selected from the group consisting of 1-acryloyl-4-methyl piperazine, N-acryloyl morpholine, N-vinyl pyrrolidone, divinylbenzene, methylene bisacrylamide, N,N′-bisacryloyl piperazine, N,N′-bisacryloyl N,N′-dimethylethylene diamine.

4,228,153

COSMETIC COMPOSITION

Pencho V. Burov, Dryanovo, and Nadejda A. Kyuleva, Sofia, bothof, Bulgaria, assignors to DSO "Pharmachim", Sofia, Bulgaria

Filed Jun. 12, 1978, Ser. No. 914,506
Claims priority, application Bulgaria, Jun. 10, 1977, 36563
Int. Cl.[2] A61K *35/12, 35/56, 31/675*
U.S. Cl. 424—95 **2 Claims**

1. A cosmetic composition including an active component comprising a mixture of a 0.6–0.8% solution of a collagen and from 0.6–1% pyridoxal-5-phosphate.

4,228,154

PURIFICATION OF PLASMA ALBUMIN BY ION EXCHANGE CHROMATOGRAPHY

Joseph D. Fisher, Chicago Heights; Willie M. Curry, and Michael E. Hrinda, both of Park Forest, all of Ill., assignors to Armour Pharmaceutical Company, Scottsdale, Ariz.

Filed Feb. 26, 1979, Ser. No. 14,837
Int. Cl.[2] A61K *37/02;* **C07G** *7/00*
U.S. Cl. 424—101 **11 Claims**

1. In the process for isolation of purified plasma albumin wherein plasma is processed by cold alcohol fractionation to develop an albumin-containing Cohn II+III supernatant fluid, an improvement in the procedure for further isolation of albumin from proteinaceous material in the fluid, said improvement comprising the steps of:

(a) intimately contacting said fluid with lipoprotein extractant means;

(b) adjusting the pH of the fluid to from about 4.5 to 4.9 and intimately contacting the pH-adjusted fluid with an anionic ion exchanger means for removing from said ph-adjusted fluid proteinaceous materials having an isoelectric point below that of albumin; and

(c) adjusting the pH of said to fluid from about 5.1 to 5.5 and intimately contacting the pH-adjusted fluid with a cationic ion exchanger means for removing from said pH-adjusted fluid proteinaceous materials having an isoelectric point above that of albumin,

whereby an albumin-containing fluid product is obtained substantially free of contaminating proteinaceous materials having an isoelectric point below or above that of albumin.

4,228,155

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,534

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **11 Claims**

1. A peptide having a formula

X-Y-D-Phe-D-Phe-Lys-Met-L

and the pharmaceutically acceptable non-toxic acid addition salts, thereof wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Y is selected from a group consisting of Trp and D-Trp; and

L is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branch alkyl groups containing 1–6 carbon atoms.

4,228,156

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,532

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **11 Claims**

1. A peptide having a formula

X-D-Trp-Z-E-G

and the pharmaceutically acceptable non-toxic acid addition salts thereof wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Z is selected from a group consisting of D-Trp and D-Phe;

E is selected from a group consisting of Trp and Phe; and

G is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branch alkyl groups containing 1–6 carbon atoms.

4,228,157

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,533

Int. Cl.[2] **H61K** *37/00;* **C08L** *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **11 Claims**

1. A peptide having a formula

X—Trp—D—Phe—Ala—Tyr—J—L

and the pharmaceutically acceptable non-toxic acid addition salts, thereof wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

J is selected from a group consisting of D-Leu and Met; and

L is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branch alkyl groups containing 1–6 carbon atoms.

4,228,158

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,553

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **16 Claims**

1. A peptide having a formula

X-Y-Z-E-G-J-L

and the pharmaceutically acceptable non-toxic acid addition salts thereof wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Y and G are independently selected from a group consisting of Tyr, Trp, and Phe;

Z and E are independently selected from a group consisting of D-Tyr, D-Trp, and D-Phe;

J is selected from a group consisting of Leu, Ile, and Met; and

L is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein

each R, R_1, and $R_2$is independently selected from a group consisting of straight and branched alkyl groups containing 1–6 carbon atoms.

4,228,159

STABILIZATION OF VITAMIN A IN PRESENCE OF TRACE MINERALS

Melvin J. MacMillan, Cranford, N.J., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jun. 18, 1979, Ser. No. 49,097

Int. Cl.[3] **A61K** *31/00, 47/00, 31/07, 33/24*

U.S. Cl. 424—175 **16 Claims**

1. An admixture of vitamin A and a trace mineral supplement containing at least one trace mineral wherein said supplement is composed of small, solid granular particles, the majority of said particles being of a size such that they pass through a 16 mesh screen, but essentially all are retained on an 80 mesh screen, each particle being an intimate mixture of:

(a) at least one trace mineral coated with

(b) an effective amount of lignin sulfonates to reduce degradation of vitamin A when in contact with said trace mineral.

4,228,160

INCLUSION COMPLEX OF CYCLODEXTRIN AND INDOMETHACIN AND A PROCESS FOR THE PREPARATION THEREOF, METHOD OF USE AND PHARMACEUTICAL COMPOSITION

Józef Szejtli; Lajos Szente; Agoston Dávid; Sándor Virág; Gyula Sebestyén, and Attila Mándi, all of Budapest, Hungary, assignors to Chinoin Gyógyszer es Vegyészeti Termékek Gyára Rt., Budapest, Hungary

Filed Jan. 24, 1979, Ser. No. 6,185

Claims priority, application Hungary, Jan. 27, 1978, CI 1803

Int. Cl.[2] A61K *31/70;* **C08B** *37/16*

U.S. Cl. 424—180 **13 Claims**

1. An inclusion complex of cyclodextrin and Indomethacin in a molar ratio of about 2:1.

11. A pharmaceutical composition of antiinflammatory activity containing an effective amount of an inclusion complex of cyclodextrin and Indomethacin in a molar ratio of about 2:1 and a pharmaceutically acceptable inert solid or liquid carrier.

4,228,161

ANTI-INFLAMMATORY COMBINATION HAVING REDUCED ULCEROGENICITY

Tsung-Ying Shen, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 28, 1979, Ser. No. 24,639

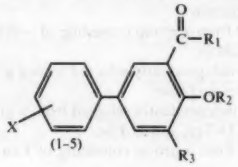
Int. Cl.[2] A61K *31/405, 31/62*

U.S. Cl. 424—232 **8 Claims**

1. In combination:

(a) 1-(p-chlorobenzoyl)-5-methoxy-2-methylindole-3-acetic acid; and

(b) a member selected from phenyl benzoic acid compounds of the formula:



wherein

$X_{1\text{-}5}$ is halo; X being on one or more of the phenyl carbon atoms;

R_1 is selected from the group consisting of hydroxy, phenoxy, diloweralkylamino, and diloweralkylamino loweralkoxy;

R_2 is selected from the group consisting of hydrogen; lower alkanoyl; and lower alkoxycarbonyl; and

R_3 is selected from the group consisting of hydrogen and methyl; and pharmaceutically acceptable, non-toxic salt thereof; wherein the molar ration of (b) to (a) is from 0.5 to 1.0 to 15.0 to 1.0.

4,228,162

DIMETHYL ISOSORBIDE IN LIQUID FORMULATION OF ASPIRIN

Louis A. Luzzi, and Joseph K. H. Ma, both of Morgantown, W. Va., assignors to Research Corporation, New York, N.Y.

Filed Jul. 9, 1979, Ser. No. 55,703

Int. Cl.[2] A61K *31/60, 31/605, 31/62*

U.S. Cl. 424—232 **5 Claims**

1. A stable liquid aspirin composition which comprises the admixture of a pharmaceutically effective concentration of acetylsalicylic acid in dimethyl isosorbide.

4,228,163

METHOD FOR TREATING PSEUDOFOLLICULITIS BARBAE

William E. Bliss, Fort Washington, Pa., assignor to Dermik Laboratories, Fort Washington, Pa.

Filed Mar. 30, 1979, Ser. No. 25,390

Int. Cl.[3] A61K *31/56, 31/47*

U.S. Cl. 424—240 **8 Claims**

1. A method for treating pseudofolliculitis barbae in humans and the prophylactic treatment thereof, which comprises: topically applying to involved areas of the human body an effective amount of a composition of benzoyl peroxide and 5-chloro-8-hydroxyquinoline in a concentration of about 0.05 to about 20% by weight of the total composition, in a suitable pharmaceutically acceptable carrier.

4,228,164

CONDENSED PURINE DERIVATIVES USEFUL FOR IMPROVING PERIPHERAL CIRCULATION

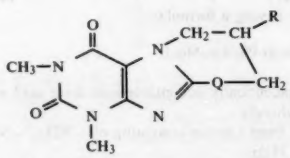
Rudolf Szebeni; Dezsö Korbonits; Kálman Harsányi, all of Budapest; Molinár Leventéné, Sződliget; László Szekeres; Gyula Papp, both of Szeged, and Gyula Sebestyén, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Nov. 7, 1978, Ser. No. 958,526

Int. Cl.[2] A61K *31/54, 31/52;* **C07D** *473/08, 513/14*

U.S. Cl. 424—246 **10 Claims**

1. A compound of the formula



(I)a

wherein

R is hydroxy, or acetyloxy Q is sulfur or a —N—R^1 group, wherein R^1 is hydrogen, $C_{1\text{-}5}$ alkyl benzyl or $C_{2\text{-}4}$ acyl, or a pharmaceutically acceptable acid addition salt thereof.

9. A pharmaceutical composition for improving the peripheral circulation, comprising as active ingredient at least one compound of the formula I as defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof admixed with the usual pharmaceutically acceptable carriers and/or solvents.

4,228,165

PHENYL ISOTHIOCYANATE DERIVATIVES AND THEIR PRODUCTION

Masaru Ogata, Kobe; Yoshihachi Watanabe, Shiga; Hiroshi Matsumoto, Takatsuki, and Katsuya Tawara, Ibaraki, all of Japan, assignors to Shionogi & Co., Ltd., Japan

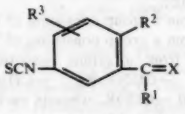
Division of Ser. No. 946,422, Sep. 25, 1978. This application Jun. 11, 1979, Ser. No. 47,803

Claims priority, application Japan, Oct. 4, 1977, 52/119789

Int. Cl.[3] A01N *43/84;* **C07C** *161/04;* **C07D** *307/64, 295/12*

U.S. Cl. 424—248.5 **12 Claims**

1. An agricultural fungicidal composition comprising a fungicidally effective amount of a compound of the formula:



wherein

X is oxygen or sulfur;

R^1 is hydroxy, phenoxy, amino, methylamino, ethylamino, propylamino, isopropylamino, butylamino, dimethylamino, methylethylamino, diethylamino, ethylbutylamino, dibutylamino, phenylamino, tolylamino, xylylamino, mesitylamino, cumenylamino, tetrahydrofurfurylamino, morpholino or methylpiperazino; but when X is sulfur R^1 must be amino, methylamino, ethylamino, propylamino, isopropylamino, butylamino, dimethylamino, methylethylamino, diethylamino, ethylbutylamino, dibutylamino, or morpholino;

R^2 is methoxy, ethoxy, propoxy, isopropoxy, butyoxy, isobutoxy, or t-butoxy; and

R^3 is hydrogen, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, t-butuyl, methoxy, ethoxy, propoxy, isopropoxy, butoxy, isobutoxy, t-butoxy, dimethylamino, methylethylamino, diethylamino, ethylbutylamino, dibutylamino, fluorine chlorine, bromine or iodine,

or its salts and one or more agriculturally suitable carriers and/or adjuvants.

4,228,166

2-KETO-4,5-DIHYDRO-3 (2H)-PYRIDAZINONES, AND THEIR USE IN TREATING MUSCLE TENSION

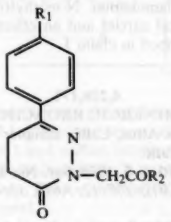
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Mar. 5, 1979, Ser. No. 17,353

Int. Cl.[2] C07D *237/04;* A61K *31/50*

U.S. Cl. 424—250 **5 Claims**

1. A method of treating muscle tension in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula:



where

R_1 is fluoro or chloro and

R_2 is branch chain lower alkyl having 3 to 4 carbon atoms.

4,228,167

DIURETIC AND VASODILATING TRICYCLIC QUINAZOLINES

Michihiro Yamamoto; Masao Koshiba, both of Nishinomiya, and Shunji Aono, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

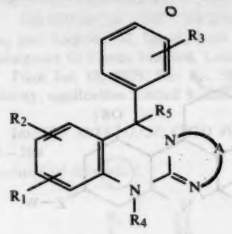
Filed Sep. 5, 1978, Ser. No. 939,869

Claims priority, application Japan, Sep. 6, 1977, 52/107643

Int. Cl.[2] A61K *31/505;* C07D *487/14*

U.S. Cl. 424—251 **6 Claims**

1. A compound of the formula,



(I)

wherein R_1, R_2 and R_3 are independently hydrogen, halogen, C_{1-3} alkyl or C_{1-3} alkoxy; R_4 is C_{1-5} alkyl, C_{3-5} alkenyl, aralkyl or cyclo C_{3-8} alkyl-C_{1-3} alkyl; R_5 is hydrogen or hydroxy; and A is C_{2-3} alkylene which may optionally be substituted by one or two C_{1-3} alkyl, or a pharmaceutically acceptable acid addition salt thereof.

6. A pharmaceutical composition comprising as an active ingredient a diuretically or vascdilatingly effective amount of a compound of claim 1, or its pharmaceutically acceptable acid addition salts and a pharmaceutically acceptable carrier.

4,228,168

AZEPINO [1,2,3-LM]-β-CARBOLINE COMPOUNDS AND PHARMACEUTICAL COMPOSITION THEREOF

Yasuhiko Sato, Urawa; Tomishige Mizoguchi, Wako; Yukitsuka Kudo, Osaka, and Ryuichi Ishida, Suita, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

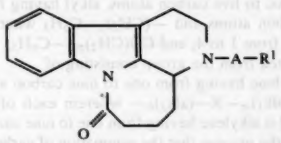
Filed Nov. 2, 1979, Ser. No. 90,528

Claims priority, application United Kingdom, Nov. 22, 1978, 45665/78

Int. Cl.[3] C07D *471/14;* A61K *31/55*

U.S. Cl. 424—256 **7 Claims**

1. An azepino[1,2,3-lm]-β-carboline compound of the formula:



wherein R^1 is hydrogen, cycloalkyl of 3 to 7 carbon atoms, phenyl, hydroxy, alkoxycarbonyl of 2 or 3 carbon atoms or alkanoyl of 2 or 3 carbon atoms, and A is single bond or straight or branched alkylene of one to 5 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

7. An anti-anoxic composition consisting essentially of a compound of claim 1 and a pharmaceutically acceptable carrier, in an amount sufficient to provide a therapeutically effective amount of said compound when administered to warm blooded animals.

4,228,169

1,9-DIHYDROXYOCTAHYDROBENZO[c]QUINOLINES AND 1-HYDROXYHEXAHYDROBENZO[c]QUINOLINE-9(8H)-ONES AS ANTIEMETIC AGENTS

Michael R. Johnson, Gales Ferry, and George M. Milne, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

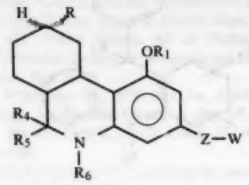
Filed Jun. 26, 1979, Ser. No. 52,324

Int. Cl.[2] A61K *27/00, 31/47*

U.S. Cl. 424—258 **27 Claims**

1. A process for the prevention and treatment of nausea in a mammal subject to said nausea which comprises administering to said mammal a compound in an amount effective to prevent

nausea, said compound being selected from the group consisting of



and the pharmaceutically acceptable acid addition salts thereof.

wherein R is selected from the group consisting of hydroxy and alkanoyloxy having from one to five carbon atoms;

R_1 is selected from the group consisting of hydrogen, benzyl, benzoyl, alkanoyl having from one to five carbon atoms and $-CO-(CH_2)_p-NR_2R_3$ wherein p is 0 or an integer from 1 to 4; each of R_2 and R_3 when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_2 and R_3 when taken together with the nitrogen to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from one to four carbon atoms in the alkyl group;

R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms and $-(CH_2)_z-C_6H_5$ wherein z is an integer from 1 to 4;

R_5 is selected from the group consisting of hydrogen, methyl and ethyl;

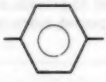
R_6 is selected from the group consisting of hydrogen, $-(CH_2)_y$-carbalkoxy having from one to four carbon atoms in the alkoxy group and wherein y is 0 or an integer from 1 to 4, carbobenzyloxy, formyl, alkanoyl having from two to five carbon atoms, alkyl having from one to six carbon atoms and $-(CH_2)_x-C_6H_5$ wherein x is an integer from 1 to 4; and $CO(CH_2)_{x-1}-C_6H_5$;

Z is selected from the group consisting of

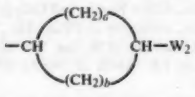
(a) alkylene having from one to nine carbon atoms;

(b) $-(alk_1)_m-X-(alk_2)_n-$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and

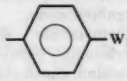
W is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

4,228,170

7- AND/OR 8-SULFUR SUBSTITUTED 1,2,3,4-TETRAHYDROISOQUINOLINE COMPOUNDS

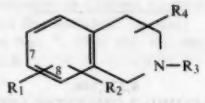
William E. Bondinell, Cherry Hill, N.J., and Robert G. Pendleton, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 30, 1979, Ser. No. 71,203

Int. Cl.[2] **A61K** *31/47;* **C07D** *217/02*

U.S. Cl. 424—258 **13 Claims**

1. A compound of the formula:



in which:

R_1 is mercapto, methylthio, methylsulfinyl, methylsulfonyl, trichloromethylthio, trichloromethylsulfinyl, trichloromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl or fluorosulfonyl;

R_2 is hydrogen, halo or trifluoromethyl and provided that when R_1 is methylthio R_2 is also methylthio, with R_1 and R_2 being limited to the 7 and 8 positions;

R_3 and R_4 are each hydrogen or lower alkyl;

or a pharmaceutically acceptable acid addition salt thereof.

9. A pharmaceutical composition in dosage unit form for inhibiting phenylethanolamine N-methyltransferase comprising a pharmaceutical carrier and an effective amount of the compound as described in claim **1**.

4,228,171

ANTICHLORINERGIC BRONCHODILATORS

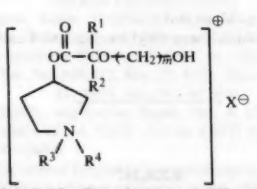
Jurg R. Pfister, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 5, 1979, Ser. No. 17,302

Int. Cl.[2] **C07D** *207/12;* **A61K** *31/40, 31/44*

U.S. Cl. 424—263 **5 Claims**

1. Compounds of the formula

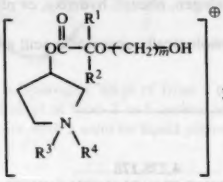


I

wherein R^1 and R^2 are the same or different and are phenyl optionally substituted with a substituent selected from the group C_1 to C_6 alkyl, C_1 to C_6 alkoxy and halo; or monovalent heterocyclic radical of aromatic character containing, in addition to a heteroatom which is oxygen, nitrogen or sulfur, 4 or 5 carbon atoms in the ring; R^3 and R^4 are the same or different and are C_1 to C_6 alkyl; m is the integer 2 through 5; and X is an anion which effectively forms a pharmaceutically acceptable, non-toxic salt.

4. An anticholinergic composition which comprises a suit-

able pharmaceutical solvent or dispersant and at least one compound of the formula



(I)

wherein R^1 and R^2 are the same or different and are phenyl optionally substituted with a substituent selected from the group C_1 to C_6 alkyl, C_1 to C_6 alkoxy and halo; or; monovalent heterocyclic radical of aromatic character containing, in addition to a heteroatom which is oxygen, nitrogen or sulfur, 4 or 5 carbon atoms in the ring; R^3 and R^4 are the same or different and are C_1 to C_6 alkyl; m is the integer 2 through 5; and X is an anion which effectively forms a pharmaceutically acceptable, non-toxic salt.

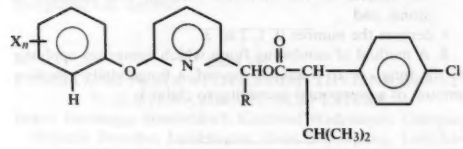
4,228,172

SUBSTITUTED PYRIDINE METHYL ESTERS OF 2-ISOPROPYL-2-(4-CHLOROPHENYL)ACETIC ACID AND THEIR USE AS INSECTICIDES

Sudarshan K. Malhotra, Walnut Creek, and John C. Van Heertum, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

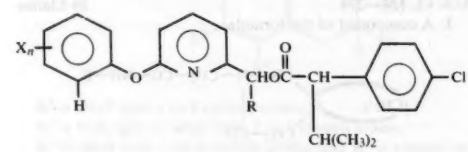
Filed Jul. 30, 1979, Ser. No. 62,453
Int. Cl.[2] A01N *9/22*; C07D *213/64*
U.S. Cl. 424—263 **33 Claims**

1. A compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, chloro, fluoro, bromo; and R represents hydrogen, cyano or ethynyl.

23. The method for the kill and control of insects which comprises contacting said insects or their habitat with a composition containing an inert carrier and as the active ingredient, an insecticidally effective amount of a compound corresponding to the formula



wherein n represents an integer of 0 to 2; X independently represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, trifluoromethyl, chloro, fluoro, bromo and R represents hydrogen, cyano or ethynyl.

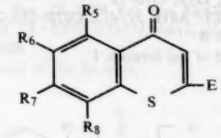
4,228,173

THIOPYRANO-BENZOPYRANS, COMPOSITIONS AND METHOD OF USE THEREOF

Hugh Cairns, and Anthony H. Ingall, both of Loughborough, England, assignors to Fisons Limited, London, England

Filed Jul. 18, 1979, Ser. No. 58,609
Claims priority, application United Kingdom, Aug. 15, 1978, 33433/78
Int. Cl.[2] A61K *31/28*; C07D *497/04*
U.S. Cl. 424—269 **9 Claims**

1. A compound of formula I,



in which an adjacent pair of R_5, R_6, R_7 and R_8 form a chain —COCH=CE—O—, and the remainder of R_5, R_6, R_7 and R_8, which may be the same or different, each represent hydrogen, hydroxy, alkyl, halogen, alkenyl, alkoxy, or $-NR_1R_2$ in which R_1 and R_2, which are the same or different, are each hydrogen or alkyl, each of R_1, R_2, R_5, R_6, R_7 and R_8, when they contain carbon, containing up to 8 carbon atoms, and

E is —COOH, a 5-tetrazolyl group or an (N-tetrazol-5-yl) carboxamido group,

and pharmaceutically acceptable salts, esters and amides thereof.

9. A method for the treatment of reversible airway obstruction or for the prevention of the excretion of excess mucous which comprises administration of an effective amount of a compound according to claim **1** to a patient suffering from such a condition.

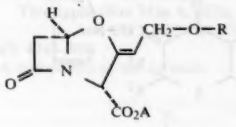
4,228,174

CLAVULANIC ACID ETHERS

Roger J. Ponsford, Horsham, and Thomas T. Howarth, Cranleigh, both of England, assignors to Beecham Group Limited, Great Britain

Division of Ser. No. 786,345, Apr. 11, 1977, which is a continuation-in-part of Ser. No. 730,475, Oct. 7, 1976, abandoned. This application Feb. 1, 1979, Ser. No. 8,421
Claims priority, application United Kingdom, Oct. 13, 1975, 41897/75; Jan. 23, 1976, 02629/76; May 8, 1976, 19000/76
Int. Cl.[2] C07D *498/04*; A61K *31/42*
U.S. Cl. 424—272 **4 Claims**

1. An ether of the formula (II):



(II)

wherein R is cyanomethyl and A is a group such that CO_2A is carboxylic acid, a pharmaceutically acceptable salt thereof or an alkyl ester thereof of 1 to 8 carbon atoms.

4,228,175

BIS-(PHENOXYALKYL-2-IMIDAZOLIN)-1,1-SULFIDES, PROCESS FOR THEIR MANUFACTURE, COMPOSITIONS WHICH CONTAIN THESE SULFIDES AS ACTIVE COMPONENT AND USE THEREOF IN PEST CONTROL

Manfred Böger, Rhein, Fed. Rep. of Germany; Josef Drabek, Oberwil, Switzerland; Günter Mattern, Liestal, Switzerland, and Water Traber, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 23, 1979, Ser. No. 69,033

Claims priority, application Switzerland, Aug. 28, 1978, 9079/78; Aug. 10, 1979, 7370/79

Int. Cl.[2] **A61K** *31/415;* **C07D** *233/22*

U.S. Cl. 424—273 R **8 Claims**

1. A compound of the formula I

(I)

wherein R_1, R_1', R_2 and R_2' are, each independently of the other, chlorine or methyl and R_3 and R_3' are, each independently of the other, hydrogen or C_1–C_4-alkyl and the acid addition salts thereof.

7. A method of controlling acarids at a locus which method comprises applying to said locus an acaricidally effective amount of a compound as claimed in claim **1**.

4,228,176

THROMBOXANE INHIBITION WITH BURIMAMIDE

Kenneth E. Eakins, Sparkill, and Geoffrey Allan, New York, both of N.Y., assignors to Nelson Research & Development Company, Irvine, Calif.

Division of Ser. No. 903,584, May 8, 1978, Pat. No. 4,172,139. This application Apr. 9, 1979, Ser. No. 28,544

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 R **7 Claims**

1. A method for treatment of an imflammatory disease condition comprising the administration to a human or animal suffering from an inflammatory disease condition of an effective, anti-inflammatory amount of Burimamide or a pharmaceutically acceptable salt thereof.

4,228,177

2,3-DIHYDRO-3-(1H-IMIDAZOL-1-YLMETHYLENE)-4H-1-BENZOTHIOPYRAN-4-ONES

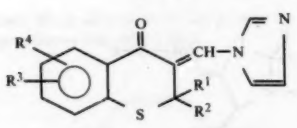
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 8, 1979, Ser. No. 64,653

Int. Cl.[3] **C07D** *409/06*

U.S. Cl. 424—273 R **9 Claims**

1. A compound of the formula



wherein

R^1 and R^2 each is hydrogen, lower alkyl, halogen, lower alkoxy, lower alkylthio, phenyl-lower alkyl, phenyl or substituted phenyl, wherein the phenyl bears one halogen, hydroxy, lower alkoxy, lower alkyl, lower alkylthio, cyano or nitro group;

R^3 and R^4 each is hydrogen, lower alkyl, lower alkylthio, lower alkoxy, halogen, phenyl, hydroxy, or phenyl-lower alkyl;

and non-toxic physiologically acceptable acid addition salts thereof.

4,228,178

COMBATING FUNGI WITH NOVEL N-SULPHENYLATED CARBAMOYL COMPOUNDS

Engelbert Kühle, Berg. Gladbach; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

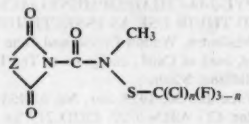
Filed Nov. 13, 1978, Ser. No. 960,396

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1977, 2754492

Int. Cl.[2] **A01N** *9/22;* **C07D** *209/48*

U.S. Cl. 424—274 **7 Claims**

1. An N-sulphenylated carbamoyl compound of the formula



in which

Z represents phenyl, cyclohexyl or cyclohexenyl attached to the balance of the molecule through two adjacent C atoms, and

n denotes the number 0, 1, 2 or 3.

6. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim **1**.

4,228,179

3-OXO-2-AZASPIRO-2-(N-METHYL)-ACETAMIDES

Johannes Hartenstein, Stegen-Wittental; Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Wolfgang Heldt, Emmendingen, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

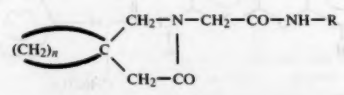
Continuation of Ser. No. 746,776, Dec. 2, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,277

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557220

Int. Cl.[2] **A61K** *31/40;* **C07D** *209/54*

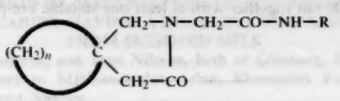
U.S. Cl. 424—274 **24 Claims**

1. A compound of the formula:



wherein R is hydrogen, alkyl of from 1 to 5 carbon atoms, or unsaturated alkyl of from 2 to 5 carbon atoms and n is 4, 5, or 6.

24. A pharmaceutical composition useful for the treatment of convulsions which comprises an anti-convulsive effective amount of at least one compound of the formula:



wherein R is hydrogen, alkyl of from 1 to 5 carbon atoms or unsaturated alkyl of from 2 to 5 carbon atoms and n is 4, 5 or 6 in admixture with a solid or liquid pharmaceutical diluent or carrier.

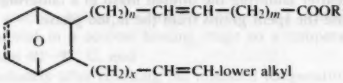
4,228,180

7-OXABICYCLOHEPTANE AND 7-OXABICYCLOHEPTENE PROSTAGLANDIN ANALOGS

Peter W. Sprague, Pennington, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 1, 1979, Ser. No. 90,226
Int. Cl.[3] A61K *31/34, 31/557;* **C07D** *307/28*
U.S. Cl. 424—285 **11 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen or lower alkyl; n is 0 to 4, m is 0 to 4 and x is 0 to 8.

10. A method of inhibiting platelet aggregation which comprises administering to a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

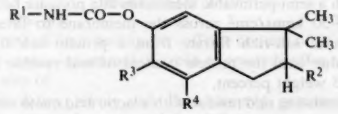
4,228,181

COMBATING PESTS WITH 3,3-DIMETHYLINDAN-5-YL N-ALKYL-CARBAMIC ACID ESTERS

Detlef Grotkopp, Duesseldorf; Karlfried Wedemeyer, Cologne; Wilhelm Brandes, Leichlingen; Hans Scheinpflug, Leverkusen, and Peter Roessler, Berg. Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 932,055
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739193
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—300 **9 Claims**

1. A 3,3-dimethylindan-5-yl N-alkyl-carbamic acid ester of the formula



R^1 is alkyl with 1 to 4 carbon atoms,

R^2 is hydrogen or alkyl with 1 to 4 carbon atoms,

R^3 is alkyl with 1 to 4 carbon atoms, and R^4 is chloine or alkyl with 1 to 4 carbon atoms.

7. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a diluent.

8. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

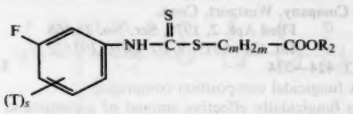
4,228,182

IMMUNOSUPPRESSIVE M-FLUORODITHIOCARBANILATES

Hewitt G. Wight; Tracey G. Call, both of San Luis Obispo, Calif., and Marvin L. Mortensen, Mesa, Ariz., assignors to The California Polytechnic State University Foundation, San Luis Obispo, Calif.

Continuation-in-part of Ser. No. 911,600, Jun. 1, 1978, which is a continuation of Ser. No. 848,433, Nov. 4, 1977, Pat. No. 4,130,578, which is a continuation-in-part of Ser. No. 773,064, Feb. 28, 1977, Pat. No. 4,110,444, which is a continuation-in-part of Ser. No. 579,449, May 21, 1975, abandoned. This application Jun. 27, 1979, Ser. No. 52,614
Int. Cl.[3] C07C *153/11;* **A61K** *31/215*
U.S. Cl. 424—300 **5 Claims**

1. A compound of the formula



wherein T is nitro, fluoro, chloro, bromo, trifluoromethyl, lower alkylsulphonyl, phenylsulphonyl, or (lower alkyl)-phenylsulphonyl;

wherein s is the integer zero or one;

wherein C_mH_{2m} is alkylene of one to 5 carbon atoms, inclusive; and

wherein R_2 is alkyl of one to 12 carbon atoms, inclusive;

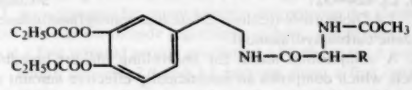
4,228,183

NOVEL PHENETHYLAMINE DERIVATIVES AND PROCESSES FOR PREPARING SAME

Tasaburo Kiguchi, Osaka; Kimiaki Hayashi, Nara, and Isao Yamaguchi, Tokyo, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 6, 1979, Ser. No. 45,955
Claims priority, application Japan, Jun. 30, 1978, 53/79938
Int. Cl.[3] A61K *31/265;* **C07C** *69/96*
U.S. Cl. 424—301 **5 Claims**

5. A pharmaceutical composition for increasing renal blood flow activity which comprises a compound of the formula:



wherein R is methyl or 2-methylthioethyl, in an amount sufficient to provide a therapeutic effect when administered, and a pharmaceutically acceptable carrier therefor.

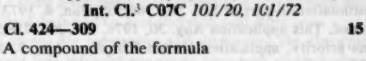
4,228,184

CARBOXYALKYLACYLAMINO ACIDS

Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application May 4, 1978, Ser. No. 903,288
Int. Cl.[3] C07C *101/20, 101/72*
U.S. Cl. 424—309 **15 Claims**

1. A compound of the formula



and salts thereof, wherein

R_1 is hydrogen, lower alkyl, phenyl-lower alkylene, hy-

droxy-lower alkylene, hydroxyphenyl-lower alkylene, amino-lower alkylene, guanidino-lower alkylene, mercapto-lower alkylene, lower alkylmercapto-lower alkylene or carbamoyl-lower alkylene;

R_2 is hydrogen or lower alkyl;

R_3 is lower alkyl;

R_4 is hydroxy or lower alkoxy; and n is 1 or 2.

14. A composition useful for alleviating angiotensin dependent hypertension in a mammalian specie containing about 10 to 500 mg. of a compound of claim **1** and a physiologically acceptable vehicle therefor.

4,228,185

N-4-(2',2'-DICHLOROCYCLOPROPROPYL)PHENYL 2''-IODOBENZAMIDE

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

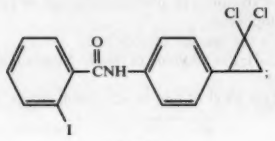
Filed Apr. 2, 1979, Ser. No. 26,468

Int. Cl.[2] **A01N** *9/20;* **C07C** *103/22*

U.S. Cl. 424—324 **3 Claims**

3. A fungicidal composition comprising:

(a) a fungicidally effective amount of a compound having the formula



and

(b) a fungicidally suitable inert carrier or diluent.

4,228,186

METHOD FOR THE CONTROL OF MANURE-BREEDING INSECTS

Lisby L. Wade, Lake Jackson, Tex.; Donald L. Clarke, Bay City, Mich., and Jack P. Arrington, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1978, Ser. No. 965,542

Int. Cl.[2] **A01N** *9/20, 9/24;* **C07C** *119/00, 131/00*

U.S. Cl. 424—327 **5 Claims**

1. 2,4-Dichloro-N-((chloro-2,4-dichlorophenyl)methylene)-benzene carbonhydrazonoyl.

2. A composition useful for controlling manure-breeding insects which comprises an insecticidally effective amount of 2,4-dichloro-N-((chloro-2,4-dichlorophenyl)methylene)benzene carbonhydrazonoyl chloride and an inert adjuvant therefor.

4,228,187

ALKYL AND CYCLOALKYLTHIOPHENYLALKYLAMINOALKANOLS, THEIR SALTS AND THE PREPARATION THEREOF

Georges E. Lambelin; Claude L. Gillet, both of Brussels, and Joseph L. Roba, Wanlin, all of Belgium, assignors to Continental Pharma, Brussels, Belgium

Continuation-in-part of Ser. No. 366,508, Jun. 4, 1973, abandoned. This application Aug. 30, 1976, Ser. No. 718,534

Claims priority, application United Kingdom, Apr. 9, 1973, 17001/73

Int. Cl.[2] **A61K** *31/135;* **C07C** *91/06*

U.S. Cl. 424—330 **3 Claims**

1. 1-(4-isopropylthiophenyl)-2-n-octylaminopropanol and its non-toxic salts.

3. A pharmaceutical composition comprising from 5–900 mg of at least one compound selected from the group consisting of 1-(4-isopropylthiophenyl)-2-n-octylaminopropanol and its non-toxic salt together with at least one suitable excipient.

4,228,188

METHOD OF MASHING AND LAUTERING

Donald H. Westermann, Brookfield; John E. Sawicki, Mequon, and Nicolaas J. Huige, Glendale, all of Wis., assignors to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Mar. 6, 1978, Ser. No. 883,907

Int. Cl.[2] **C12C** *11/00*

U.S. Cl. 426—11 **4 Claims**

1. A method of mashing and lautering, comprising the steps of preparing a mash of malt and water with the malt-to-water weight ratio being in the range of 0.35 to 0.45 to 1, heating the mash to a temperature sufficiently high to liquify the starches in the malt and convert the starches to fermentable sugars, diluting the mash after conversion with sufficient water to provide an equivalent malt-to-water ratio of less than 0.25 to 1, and thereafter lautering the diluted mash in a lautering vessel to separate the spent grains from the liquid phase.

4,228,189

PREPARATION OF YOGURT AND QUARK

Alec F. Henson, Twickenham, England, and Gerard M. M. Bret, The Hague, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 644,698, Dec. 29, 1975, abandoned, which is a division of Ser. No. 538,426, Jan. 3, 1975, Pat. No. 3,963,836, which is a continuation of Ser. No. 358,441, May 8, 1973, abandoned. This application Jul. 3, 1978, Ser. No. 921,531

Claims priority, application United Kingdom, May 10, 1972, 21793/72

The portion of the term of this patent subsequent to Jun. 15, 1993, has been disclaimed.

Int. Cl.[2] **A23C** *19/02, 19/14*

U.S. Cl. 426—40 **1 Claim**

1. Quark having a coagulated protein content of 4% to 15% and at least a 100% over-run in the absence of added whipping agents prepared by the process of

(a) pasteurizing skim milk at a temperature from 55°–80° C.,

(b) rapidly cooling the milk to a temperature not exceeding 50° C., at which the growth of micro-organisms is suppressed, and filtering the pasteurized liquid by contact with a semi-permeable membrane at a pressure between 1 and 50 kgms/cm^2 across the membrane to filter off a mineral salt-rich filtrate from a protein-rich filtration residue until the protein content of said residue is from 4–15 weight percent,

(c) inoculating said residue with a lactic acid quark culture in an amount from 0.1–5 weight percent,

(d) adjusting the temperature of the inoculated residue within the range from 20°–35° C.,

(e) incubating the inoculated residue until total acidity expressed as lactic acid is about 0.8–0.9%,

(f) decreasing the temperature until further growth is suppressed,

(g) shearing the coagulant by stirring to a creamy consistency, and

(h) whipping the product resulting from step (g) to at least 100% overrun to provide said quark.

4,228,190

METHOD OF MANUFACTURE OF LOW CALORIE MARGARINE HAVING A PROTEIN CONCENTRATE FROM SKIMMED MILK

Kurt Wallgren, and Tage Nilsson, both of Göteborg, Sweden, assignors to Mjolkcentralen Arlan, Ekonomisk Forening, Göteborg, Sweden

Filed Nov. 20, 1978, Ser. No. 961,926
Claims priority, application Sweden, Nov. 23, 1977, 7713275
Int. Cl.[2] A23D *3/02*
U.S. Cl. 426—421 10 Claims

1. A method for the manufacture of margarine of the water-in-oil type having a low calorie value and a high content of proteins which comprises emulsifying a water phase containing 20–24% proteins into a fat phase composed of oils and/or fats to provide a water-in-oil emulsion comprised of about 35–65% fat phase and 65–35% water phase wherein

said water phase is prepared by acidifying a raw material selected from the group consisting of skimmed milk, an aqueous solution of skim milk powder and mixtures thereof to a pH of 4–5 to precipitate protein therefrom,

heating the acidified raw material in a first heating stage to a temperature of about 35°–65° C.,

maintaining said temperature for a period of at least 15 minutes,

then quickly raising the temperature of the acidified raw material in a second heating stage to a temperature of about 60°–95° C. and

immediately after reaching the intended temperature, separating the precipitated protein and

cooling the separated protein to at least the emulsification temperature to provide said water phase, and wherein

said fat phase is prepared independently of the production of said water phase by admixing fats and/or oils,

heating said fat phase to a temperature of 38°–55° C.,

emulsifying said water phase in said fat phase at a temperature of 38°–55° C. of both phases to directly obtain a water-in-oil emulsion,

pasteurizing the emulsion thereby obtained and

cooling and packing the pasteurized water-in-oil margarine.

4,228,191

MICROBIOLOGICAL DECAFFEINATION OF AQUEOUS LIQUIDS

Gerhard J. Haas, Woodcliff Lake, N.J., and Barry Stieglitz, Montreal, Canada, assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 570,286, Apr. 21, 1975, abandoned. This application Oct. 2, 1978, Ser. No. 947,952
Int. Cl.[2] A23F *1/10*
U.S. Cl. 426—45 3 Claims

1. A method for reducing the caffeine content of an aqueous caffeine-containing extract of green or roasted coffee comprising the step of:

(a) disrupting whole cell Pseudomonad organisms, said organisms being selected from the group consisting of Pseudomonad putida, NRRL B-8051 Pseudomonad fluorescens, NRRL B-8052 and Pseudomonad fluorescens, NRRL B-8053 and combinations thereof,

(b) separating a cell-free, enzyme-containing extract from the cellular material, and

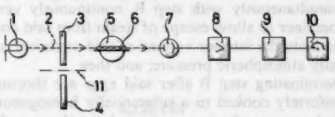
(c) contacting, under aerobic conditions and in the presence of reduced diphosphopyridine nucleotide, a caffeine-containing solution with the enzymes contained in the extract of step b) for a period of time sufficient to obtain substantial reduction in the caffeine content of the solution.

4,228,192

METHOD AND APPARATUS FOR THE QUANTITATIVE DETERMINATION OF BEER INGREDIENTS

Ulrich C. Sanden, Hildesheim, Fed. Rep. of Germany, assignor to Diessel GmbH & Co., Hildesheim-Bavenstedt, Fed. Rep. of Germany

Filed Mar. 5, 1979, Ser. No. 17,569
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1978, 2809910
Int. Cl.[2] G01N *21/26*
U.S. Cl. 426—231 8 Claims



1. A method for quantitatively determining the alcohol, wort, and carbon dioxide ingredients of beer comprising:

(a) passing said beer through a conduit;

(b) passing infrared light having a first wavelength between 2.9 and 3.1 microns through said beer in said conduit;

(c) passing infrared light having a second wavelength between 9.6 and 9.8 microns through said beer in said conduit;

(d) passing infrared light having a third wavelength between 4.2 and 4.4 microns through said beer in said conduit;

(e) measuring the absorption of said first wavelength and displaying an alcohol percentage;

(f) measuring the absorption of said second wavelength and displaying a wort percentage; and

(g) measuring the absorption of said third wavelength and displaying a carbon dioxide percentage.

2. An apparatus for quantitatively determining the alcohol, wort and carbon dioxide ingredients of beer, comprising:

(a) a first infrared source generating a beam having a wavelength between 2.9 and 3.1 microns along a first optical axis;

(b) a second infrared source generating a beam having a wavelength between 9.6 and 9.8 microns along a second optical axis;

(c) a third infrared source generating a beam havng a wavelength between 4.2 and 4.4 microns along a third optical axis;

(d) a line passing said beer having a flow axis;

(e) a first attenuated total reflection cell located along said first optical axis and through said flow axis;

(f) a second attenuated total reflection cell located along said second optical axis and through said flow axis;

(g) a third attenuated total refelection cell located along said third optical axis and through said flow axis;

(h) means for measuring and displaying the absorptivity of said first infrared source to give said alcohol percentage;

(i) means for measuring and displaying the absorptivity of said second infrared source to give said wort percentage; and

(j) means for measuring and displaying the absorptivity of said third infrared source to give said carbon dioxide percentage.

4,228,193

METHOD FOR MAKING SCRAMBLED EGGS

James Schindler, Naperville, and Anthony R. Nugarus, Chicago, both of Ill., assignors to Restaurant Technology, Inc., Oak Brook, Ill.

Continuation of Ser. No. 835,644, Sep. 22, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,311

Int. Cl.[2] A23L *1/32*

U.S. Cl. 426—233 **27 Claims**

1. The method of cooking of scrambled eggs in a containerized batch comprising the steps of:

A. charging a container with uncooked, shelled eggs with the yolks unmixed;

B. without separately stirring said eggs, introducing a plurality of jets of steam at spaced, stationary locations in the interior of said eggs for a single, uninterrupted period to disperse said steam therethroughout whereby said eggs are agitated and cooked;

C. simultaneously with step B, continuously venting said container to allow escape of steam from said container to maintain the interior volume of said container at substantially atmospheric pressure; and then

D. terminating step B after said eggs are thoroughly and uniformly cooked to a substantially homogenous scrambled egg mass having an expanded volume and which is light and tender and delectable in appearance and flavor.

4,228,194

ELECTRICALLY CONDUCTIVE ARTICLE AND METHOD OF MAKING THE SAME

Ernest P. Meeder, 726 Fairview Ave., Glen Ellyn, Ill. 60137

Filed May 14, 1979, Ser. No. 38,730

Int. Cl.[2] D04H *1/00*

U.S. Cl. 428—288 **17 Claims**

1. An electrically conductive article which is effectively incapable of holding a static electric charge, comprising:

a flexible mass of resilient insulating material having resilient conductive filaments distributed randomly and effectively uniformly therethrough to define a plurality of continuously conductive paths entirely through said mass, and a thin coating on each said filament of a cohesive lubricating material which is adherent to said filaments and repellant to said insulating material.

4,228,195

SEMI-MOIST PET FOOD PRODUCT AND PROCESS

Ronald D. Priegnitz, Algonquin, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

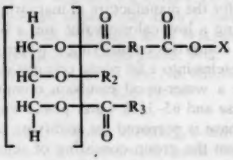
Filed Aug. 4, 1978, Ser. No. 931,203

Int. Cl.[2] A23K *3/00*

U.S. Cl. 426—321 **14 Claims**

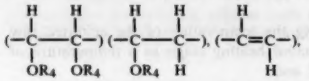
1. An extruded non sticking particulate semi-moist pet food containing moisture in the range 31–50 percent, and a blend of oil seed-derived protein source ingredient in an amount between 5 and 50 percent, meat-derived protein source ingredient in an amount between 5 and 50 percent, fat in an amount from 0 to 12 percent and amylaceous ingredients in an amount between 5 and 50 percent, as well as sufficiently high concentration of other components to provide microbiological stability, the improvement comprising the addition thereto of an effective anti sticking amount of a mono ester of a polybasic acid having 3–10 carbons, inclusive, of a member selected from the group fatty acid mono glyceride and fatty acid diglyceride, the fatty acid having from 10–24 carbons, said esters being present in an amount between 0.1 percent and 0.45 percent by weight.

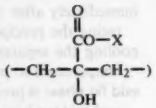
7. In a method for manufacturing a non sticking particulate pet food having moisture levels in the range 31–50 percent, fat in an amount from 0 to 12 percent, amylaceous ingredients in the range 5–50 percent, oil seed-derived protein source ingredients in the range 5–50 percent, meat-derived protein source ingredients in the range 5–50 percent, and total protein in the range 10–50 percent, said pet food having sufficiently high concentration of other components to provide microbiological stability and in which all the ingredients are intimately admixed to form a dough-like mass, and in which the resulting dough-like mass is extruded at temperatures in the range 150° F.–260° F., and the extruded product is cut into discrete pieces, the improvement comprising: admixing with the ingredients an anti sticking agent selected from the group of polybasic acid mono esters of fatty acid mono and diglycerides of the formula:



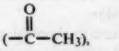
wherein X includes, H, Na^+, K^+, Ca^{++};

R_1 includes ($-C_N H_{2N}-$) wherein N is an integer from 1–10 inclusive,





wherein R_4 is H,



or ($-CH_3$), and X is defined above; and

R_2 is H or fatty acid substituent having 6–24 carbons;

R_3 is the substituent whereby

is the fatty acid substituent having 6–24 carbons;

and wherein the use of the brackets is intended to denote that any of the substituents at the right of the brackets may be positioned at any of the glyceride substituent positions of the glyceride substituent denoted at the right within the brackets.

4,228,196

PROCESS FOR PREPARING PRECOOKED POTATO PRODUCTS

Merle L. Weaver, Martinez, and Keng C. Ng, Berkeley, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 853,717, Nov. 21, 1977, abandoned. This application Oct. 2, 1979, Ser. No. 81,245

Int. Cl.[3] A23L *1/216*

U.S. Cl. 426—407 **4 Claims**

1. A process for preparing precooked non-par-fried French-fry potato products, which comprises

(a) washing and peeling raw potatoes,

(b) cutting the raw potatoes into French-fry pieces,

(c) cooking the raw potato pieces at a temperature below the temperature at which sloughing of the potato surface would occur if the whole potato were cooked to its center

at that temperature, said sloughing occurring at a temperature of about 81°–83° C. for a period of 5 to 45 minutes,

(d) heating the so-cooked potato pieces of step c in air at a temperature of about 66°–93° C. for a period of about 5 to 30 minutes to reduce the moisture content thereof about 10 to 60%,

(e) cooking the potato pieces of step d at a temperature of about 50° to 100° C. for a period of about 5 to 45 minutes, and then

(f) preserving the so-cooked potatoes in the absence of starch suspensions.

4,228,197

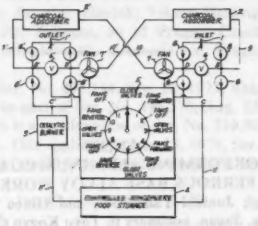
ATMOSPHERE CONTROLLING METHOD AND APPARATUS FOR FOOD STORAGE

John E. Means, Kirkland, Wash., assignor to Food Storage Systems, Inc., Yakima, Wash.

Continuation-in-part of Ser. No. 811,249, Jun. 29, 1977, abandoned. This application Jan. 18, 1979, Ser. No. 4,314

Int. Cl.² A23K *3/02*

U.S. Cl. 426—419 **22 Claims**



1. The method of controlling the atmosphere in a substantially sealed food storage chamber which comprises, in sequence:

circulating air from the food storage chamber through an adsorber and back to the food storage chamber for scrubbing carbon dioxide from the food storage chamber air;

circulating external atmospheric air through the adsorber for purging carbon dioxide from the adsorber;

displacing external atmospheric air in the adsorber with air from the food storage chamber without introducing such external atmospheric air into the food storage chamber; and

again circulating air from the food storage chamber through the adsorber and back to the food storage chamber for scrubbing carbon dioxide from the food storage chamber air.

11. In atmosphere controlling apparatus for a food storage system including:

a substantially sealed storage chamber for storing food;

first adsorber means for scrubbing carbon dioxide from air passed therethrough;

second adsorber means for scrubbing carbon dioxide from air passed therethrough;

an external atmosphere inlet;

an external atmosphere outlet; and

conduit means interconnecting the storage chamber, the first and second adsorber means, the external atmosphere inlet and the external atmosphere outlet;

the improvement comprising circulating means for automatically and sequentially effecting at least the following three circulations of air through the conduit means:

(1) a first circulation in which purging atmospheric air passes from the external atmosphere inlet through the first adsorber means and out the external atmosphere outlet for purging carbon dioxide from the first adsorber means and storage chamber air is circulated from the storage chamber through the second adsorber means and back to the storage chamber for scrubbing carbon dioxide from such storage chamber air;

(2) a second circulation in which air is transferred from the second adsorber means to the first adsorber means such that scrubbed storage chamber air from the second adsorber means is introduced into the first adsorber means and purging atmospheric air in the first adsorber means is displaced from the first adsorber means without being introduced into the storage chamber; and

(3) a third circulation in which purging air passes from the external atmosphere inlet through the second adsorber means and out the external atmosphere outlet for purging carbon dioxide from the second adsorber means and storage chamber air is circulated from the storage chamber through the first adsorber means and back to the storage chamber for scrubbing carbon dioxide from such storage chamber air.

4,228,198

SWEETENING COMPOSITIONS CONTAINING ARABINOGALACTAN

Malcolm L. E. Burge, Thatcham, and Zdenek L. A. Z. Nechutny, Reading, both of England, assignors to Tate & Lyle Limited, London, England

Continuation-in-part of Ser. No. 700,310, Jun. 28, 1976, abandoned. This application May 26, 1978, Ser. No. 909,834

Claims priority, application United Kingdom, Jul. 4, 1975, 28217/75; Jul. 4, 1975, 28232/75

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **22 Claims**

1. A sweetening composition comprising at least one sweetener selected from the group consisting of the protein sweetener thaumatin, the protein sweetener monellin and saccharin together with a sweetener after-taste reducing amount of arabinogalactan, the ratio of arabinogalactan to said sweetener being such that the concentration of arabinogalactan does not detract from sweetness level or impart body or mouth feel or exceed 2.5% of an ingestible product or oral composition when the composition is added to said ingestible product or oral composition in an amount effective to sweeten said ingestible product or oral composition, and in which when saccharin is present in the absence of said protein sweeteners the ratio of arabinogalactan to saccharin does not exceed 1:1.

4,228,199

COLD-WATER DISPERSIBLE, GELLING POTATO STARCH

Chung W. Chiu, Princeton, and Morton W. Rutenberg, North Plainfield, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jul. 5, 1979, Ser. No. 54,860

Int. Cl.² A23L *1/187*

U.S. Cl. 426—578 **10 Claims**

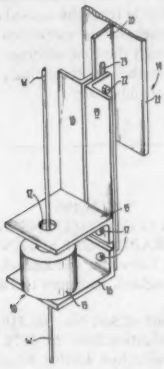
1. A cold-water dispersible, modified potato starch with gelling properties, prepared by drum-drying a potato starch which has been reacted with a crosslinking agent such the the crosslinked starch has a Brabender Viscosity Differential, measured between 80° and 95° C., of from about −35 to +180%, measured at 5% solids using a 700 cm.-g. cartridge, and has a Brabender viscosity at 80° C. of up to about 3100 B.U., measured at 5% solids, or of from about 800 to 1400 B.U., measured at 7% solids using a 700 cm.-g. cartridge, said crosslinked starch after drum-drying being capable of forming a gel having a Bloom strength of at least 60 grams.

4,228,200

CONTROLLING METAL COATINGS ON WIRE, STRIP AND THE LIKE EMERGING FROM METAL BATHS

Anthony J. Sander, Bonbeach; Jack P. Sciffer, New Lambton, and Richard W. Whitton, Cardiff, all of Australia, assignors to Australian Wire Industries Proprietary Limited, Victoria, Australia

Filed Nov. 22, 1978, Ser. No. 962,939
Claims priority, application Australia, Dec. 15, 1977, PD2788; May 25, 1978, PD4509
Int. Cl.[2] B05D 3/14
U.S. Cl. 427—47 13 Claims



1. A method of controlling the coating of a wire, strip, mesh or the like, emerging substantially vertically from molten metal baths, comprising subjecting said wire, strip, mesh or the like to an alternating electromagnetic field generated by single phase alternating electric current supplied to an electromagnetic device which is at least partially immersed in the bath, said field being applied at or below the point of emergence of the wire, strip, mesh or the like from the molten metal bath with the point of emergence of said wire, strip, mesh or the like being within the electromagnetic field to thereby control the coating weight per unit of area.

4,228,201

METHOD FOR RENDERING A NON-PLATABLE SEMICONDUCTOR SUBSTRATE PLATABLE

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 803,777, Jun. 6, 1977, Pat. No. 4,181,760. This application Aug. 7, 1978, Ser. No. 931,513
Int. Cl.[3] C23C 3/02; B05D 3/10
U.S. Cl. 427—92 11 Claims

1. A process for rendering a non-platable semiconductor substrate platable comprising the step of contacting said semiconductor substrate with a promoter composition comprising metal ions selected from the group consisting of nickel, cobalt, iron, copper, and mixtures thereof, and a reducing agent selected from the group consisting of amine boranes, borohydrides, hydrazine, and derivatives thereof, wherein said reducing agent is capable of chemically reacting with said semiconductor substrate and said metal ions, and further wherein the concentration of said reducing agent relative to said metal ions is so adjusted as to form sufficient metallic sites on the substrate for a subsequent plating step and to permit the initial chemical interaction of the reducing agent with the semiconductor substrate and then the heterogeneous reduction of some of the metal ions present in the promoter composition.

4,228,202

METHOD FOR MAKING A CELLULOSIC MATERIAL FIRE-RESISTANT

Bo O. E. Tjännberg, Box 5140, 421 05 Västra Frölunda, Sweden

Filed Jun. 4, 1979, Ser. No. 44,999
Claims priority, application Austria, Jun. 16, 1978, 4389/78
Int. Cl.[3] B05D 7/00, 3/02; C09D 5/16, 5/18
U.S. Cl. 427—212 15 Claims

1. A method of manufacturing fire-resistant wood-products comprising:

impregnating disintegrated wood material with an aqueous solution containing at least 2% phosphoric acid and 1–10% ammonium sulphate, which may be partly or completely replaced by a third as big quantity of ammonium phosphate, the quantity of said solution being 35–70% of the total weight of said solution plus wood material,

drying the impregnated wood material to a maximum moisture content of 5% by weight, supplying glue to the impregnated, dried wood material, and

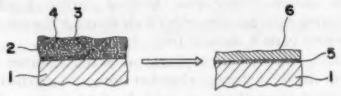
forming wood-products of the combined impregnated wood material and glue.

4,228,203

METHOD OF FORMING ALUMINUM COATING LAYER ON FERROUS BASE ALLOY WORKPIECE

Toshiro Yagi; Junichi Yamamoto, and Hideo Kohara, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Jan. 23, 1979, Ser. No. 5,914
Claims priority, application Japan, Jan. 27, 1978, 53/8491; Feb. 1, 1978, 53/11020; Sep. 13, 1978, 53/113127
Int. Cl.[3] C23C 9/00
U.S. Cl. 427—229 2 Claims



1. A method of forming an aluminum coating layer on the surface of a workpiece of austenite stainless steel which comprises the steps of applying onto the surface of the stainless steel workpiece a coating solution containing 50 to 90% by weight of aluminum or aluminum alloy particles of 10 to 500μ and 10 to 50% by weight of a vinyl acetate resin having a high decomposition burning temperature with slow burning speed and being soluble in a solvent at normal temperature, with subsequent drying thereof to form a resin coating layer containing aluminum on the surface of the stainless steel workpiece, and thereafter subjecting said workpiece thus treated to heating to a temperature higher than melting point of the aluminum or aluminum alloy particles so as to form an Al plated layer on the surface of said stainless steel workpiece;

then heating said stainless steel workpiece having the Al plated layer on the surface thereof at temperatures of 700° to 850° C. for more than 10 minutes to form a compound layer mainly composed of Fe-Al on the surface of said stainless steel workpiece; and

heating said stainless steel workpiece having said compound layer formed on the surface thereof at temperatures of 900° to 1000° C. for more than 30 minutes to form an Al alloy layer mainly composed of Al and Fe on the surface of said stainless steel workpiece.

4,228,204

METHOD OF TREATING GLASS FIBERS

Katuji Matuura, Mibu, Japan, assignor to Daiichikasei Co., Ltd., Tochigi, Japan

Filed Dec. 22, 1978, Ser. No. 972,513
Claims priority, application Japan, Jun. 26, 1978, 53/77166; Aug. 31, 1978, 53/106559
Int. Cl.[2] B05D *3/02*
U.S. Cl. 427—372.2 13 Claims

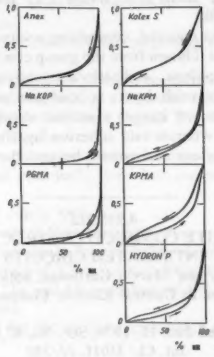
1. A method of imparting chemical resistance to glass fibers which comprises the steps of treating glass fibers with a substantially aqueous solution of 2–25% by weight of a metal salt selected from the group consisting of zinc salt, lead salt, tin salt or mixtures thereof, to form a protective coating having high chemical resistance on the surface of the glass fibers, then washing the treated glass fibers with water and thereafter drying the washed glass fibers at a temperature of from 80 deg. C. to 200 deg. C.

4,228,205

METHOD FOR PRODUCING THIN-WALLED ARTICLES FROM PLASTIC OR RUBBER

Slavko Hudecek; Jaroslav Hnidek; Viktor Heidingsfeld; Jan Kolarik, and Jiri Zelinger, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 837,144, Sep. 28, 1977, which is a continuation-in-part of Ser. No. 496,370, Aug. 12, 1974, abandoned, which is a continuation of Ser. No. 210,401, Dec. 21, 1971, abandoned. This application Jan. 23, 1979, Ser. No. 5,842
Claims priority, application Czechoslovakia, Dec. 23, 1970, 8763-70
Int. Cl.[2] B32B *3/26, 5/18*
U.S. Cl. 428—35 2 Claims



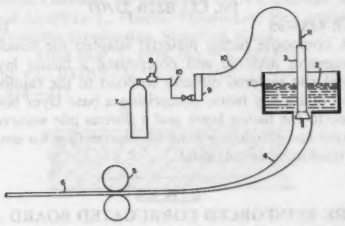
1. An unfoamed, thin-walled article of a maximum thickness of 3 mm. and having a density in the range from 350 to 1500 kg/m^3 comprising a plastic or rubber carrier having uniformally dispersed within said carrier between 10 and 50% by weight of finely divided particles, below 50μ in size, of a polymeric non-ionic organic hydrophilic macromolecular filler, said polymeric filler being crosslinked sufficient to render the same infusible and insoluble in said carrier, said filler being insoluble in water, said filler containing pendent polar groups selected from the group consisting of hydroxy, amine, or amide groups, said polymeric filler being able to bind water vapor reversibly and being selected from the group consisting of poly(hydroxyethyl methacrylate), poly(ethylene glycol monomethacrylate), poly(glyceryl monomethacrylate), terpolymer of methacrylic acid, methacrylamide and ethylene glycol dimethacrylate and amides of poly(acrylic acid) and poly(methacrylic acid).

4,228,206

METHOD OF PROCESSING GLASS TUBING

John S. Fabisak, Greenland, N.H., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 910,419, May 30, 1978, abandoned. This application May 18, 1979, Ser. No. 40,267
Int. Cl.[2] C03B *15/14;* C03C *15/00, 17/00*
U.S. Cl. 428—35 9 Claims



1. The method of making fluorescent lamps so as to increase the brightness thereof comprising the steps of: drawing hot glass from a melt through a bag stage, where the glass is above its softening temperature, and into the shape of tubing; dispensing into the hot bag an acidic gas which reacts with alkali on the inner surface of the hot glass to form water soluble alkaline salts; cooling the tubing and cutting it into predetermined lengths; coating said predetermined lengths with phosphor; and forming said coated predetermined lengths into fluorescent lamps.

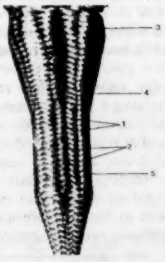
9. A fluorescent lamp made by the method of claim 1.

4,228,207

THREE-DIMENSIONAL SHAPED ARTICLES

Pierre Porte, Lyon, and Jean Togny, Sainte-Foy-les-Lyon, both of France, assignors to Societe Civile d'Etudes et de Recherches pour L'Obtention de Fibres Minerales (S.E.R.O.F.I.M.), Paris, France

Filed Aug. 29, 1978, Ser. No. 937,791
Claims priority, application France, Sep. 8, 1977, 77 27686
Int. Cl.[2] D04C *1/04*
U.S. Cl. 428—80 8 Claims



1. A flexible, three-dimensional, shaped article which consists essentially of a flexible, unimpregnated, two-dimensional braided structure made of non-braided yarns or tows having a variable crossing angle and based on fibers selected from the class consisting of graphite fibers and carbon fibers, said shaped article having a varying cross-section.

4,228,208
COMPOSITE MATERIAL OF FACING LAYER AND PILE KEY FABRIC

Michael D. Smith, Rugby; Eric K. L. Mason, Colchester, and Robert J. Morley, Spondon, nr. Derby, all of England, assignors to Courtaulds Limited, London, England

Filed Jun. 28, 1978, Ser. No. 919,952

Claims priority, application United Kingdom, Jul. 7, 1977, 28497/77, Nov. 3, 1977, 45727/77

Int. Cl.[2] B32B *33/00*

U.S. Cl. 428—95 **14 Claims**

1. A composite facing material adapted for bonding to a reinforcement material and comprising a facing layer of a thermoplastic material difficult to bond to the reinforcement material and a key fabric comprising a base layer bonded on one face to the facing layer and a fibrous pile secured to the base layer and projecting from its reverse face for embedding in the reinforcement material.

4,228,209
WIRE REINFORCED CORRUGATED BOARD AND METHOD AND APPARATUS FOR MAKING SAME

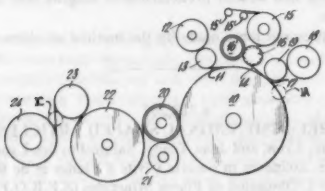
Marc A. Chavannes, 4044 Roberts Point Ave., Sarasota, Fla. 33581

Continuation of Ser. No. 771,993, Feb. 25, 1977, abandoned, which is a continuation of Ser. No. 551,978, Feb. 21, 1975, abandoned. This application Jun. 6, 1978, Ser. No. 913,242

The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.

Int. Cl.[2] B32B *29/02;* **B31F** *1/24*

U.S. Cl. 428—108 **23 Claims**



1. A wire reinforced plastic structure comprising a wire reinforced corrugated plastic layer with said corrugations corrugating both said plastic layer and said wires and extending transversely of said wires, and at least one sheet of plastic bonded to the crest portions on one side of said corrugated layer.

11. The method of manufacturing reinforced corrugated plastic board comprising the steps of adhering a plurality of spaced parallel wires to a plastic web, corrugating said web transversely of said wires, and then adhering a second plastic web to the crest portions of at least one side of said corrugated web.

20. Apparatus for manufacturing reinforced corrugated plastic board comprising a heated drum, means for feeding a plastic web about said drum, means for adhering a plurality of wires in spaced parallel relationship to and lengthwise of said web while on said drum, a pair of cooperating corrugating rollers, means for feeding said plastic and wire structure through said corrugating rollers and means for adhering a second of plastic web to the crest portions on a least one side of said corrugated plastic and wire structure.

4,228,210
PLATE OR THE LIKE WITH SERRATED OPENING

Jack B. Scribner, Dayton, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 30, 1978, Ser. No. 873,545

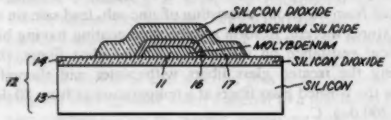
Int. Cl.[2] F16C *27/02;* **B32B** *3/10*

U.S. Cl. 428—131 **5 Claims**

1. An improved plate and press-fitted bearing member assembly, in which an annular bearing member having a cylindrical outer surface is press-fitted into an opening formed in a plate in which maximum bearing pressing forces are established to prevent damage to the bearing member during assembly, comprising:

(a) a metallic bearing support plate,

(b) means in said plate defining a bearing-receiving opening, the inside diameter of said opening being defined by a series of arcuately spaced, inwardly-projecting metallic land portions alternating with a series of intermediate relieved portions, said inwardly-projecting land portions



defining a generally circular outline the diameter of which forms an interference fit with the outer cylindrical surface of said bearing member, and the relieved portions providing spaces for the flow of metal plate material during the press fitting of said bearing member into said plate thereby avoiding exceeding said maximum pressing force on said bearing member, and

(c) an annular bearing member press-fitted into said bearing receiving opening in said plate.

4,228,211
DRY TRANSFER MATERIAL

Arnold Haazebroek, Etten Leur, Netherlands, assignor to Grafische Onderneming Mago B.V., Blaricum, Netherlands

Filed Sep. 22, 1978, Ser. No. 945,708

Int. Cl.[2] B32B *3/18;* **B41M** *3/12;* **B44C** *1/16*

U.S. Cl. 428—203 **8 Claims**

1. Dry transfer material, comprising a support of a transparent polyalkylene, chosen from the group consisting of polyethylene, polypropylene, and ethylenepropylene copolymers, coated with a varnish layer, at least one printing ink layer forming the desired image, a second varnish layer and an adhesive layer, wherein said adhesive layer contains a primer for said polyalkylene and extends beyond the contours of said varnish layers.

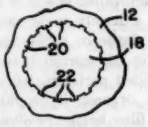
4,228,212
COMPOSITE CONDUCTIVE STRUCTURES IN INTEGRATED CIRCUITS

Dale M. Brown, and Marvin Garfinkel, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,889

Int. Cl.[2] H01L *21/283*

U.S. Cl. 428—209 **11 Claims**



1. In combination,

a substrate of semiconductor material having a major surface,

a layer of insulating material overlying said major surface,

a conductor of a refractory metallic material which is substantially non-reactive with silicon dioxide overlying said insulating layer,

a layer of a silicide of said metallic material overlying the exposed surfaces of said conductor,

a layer of silicon dioxide overlying the exposed surfaces of said layer of said silicide.

4,228,213

METHOD OF DEPOSITING A STRESS-FREE ELECTROLESS COPPER DEPOSIT

William M. Beckenbaugh, East Amwell Township, Hunterdon County, and Kim L. Morton, Delaware Township, Hunterdon County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 956,946, Nov. 2, 1978, Pat. No. 4,167,601, which is a continuation-in-part of Ser. No. 741,639, Nov. 15, 1976, abandoned. This application Aug. 13, 1979, Ser. No. 65,807

Int. Cl.[2] B32B *3/10*; **C23C** *3/02*

U.S. Cl. 428—209 **41 Claims**

1. A method of depositing a stress-free copper deposit on a surface which comprises contacting a catalyzed surface with a solution comprising:

(a) a source of cupric ions;

(b) a reducing agent for said cupric ions;

(c) a complexing agent for the solution selected from the group consisting of (1) cyclohexendiaminetetraacetic acid, (2) a salt of (1), and (3) a mixture of the foregoing complexing agents;

(d) a stabilizer for the solution comprising a mercury compound; and

(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of the Elements.

13. A method of rendering an electroless copper deposition solution capable of having deposited therefrom a stress-free copper deposit which comprises combining in the solution:

(a) a complexing agent for the solution selected from the group consisting of (1) cyclohexendiaminetetraacetic acid, (2) a salt of (1), and (3) a mixture of the foregoing complexing agents;

(b) a stabilizer for the solution comprising a mercury compound; and

(c) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of the Elements.

16. An aqueous electroless plating solution capable of depositing therefrom an essentially stress-free copper deposit comprising:

(c) a source of cupric ions;

(b) a reducing agent for said cupric ions;

(c) a complexing agent for the solution selected from the group consisting of (1) cyclohexendiaminetetraacetic acid, (2) a salt of (1), and (3) a mixture of the foregoing complexing agents;

(d) a stabilizer for the solution comprising a mercury compound; and

(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of Elements.

29. An article of manufacture comprising a substrate and a stress-free copper deposit on at least one surface thereof, deposited from an electroless copper plating solution comprising:

(a) a source of cupric ions;

(b) a reducing agent for said cupric ions;

(c) a complexing agent for the solution selected from the group consisting of (1) cyclohexendiaminetetraacetic acid, (2) a salt of (1), and (3) a mixture of the foregoing complexing agents;

(d) a stabilizer for the solution comprising a mercury compound; and

(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of Elements.

4,228,214

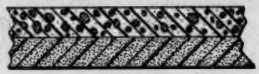
FLEXIBLE BILAYERED SHEET, ONE LAYER OF WHICH CONTAINS ABRASIVE PARTICLES IN A VOLATILIZABLE ORGANIC BINDER AND THE OTHER LAYER OF WHICH CONTAINS ALLOY PARTICLES IN A VOLATILIZABLE BINDER, METHOD FOR PRODUCING SAME AND COATING PRODUCED BY HEATING SAME

James Q. Steigelman, Athens; Roger B. Bargainnier, Towanda, both of Pa.; Glenn A. Shaffer, deceased, late of Towanda, Pa.; by Irene S. Charland, administrator DBN CTA, New Albany, Pa., and Geoffrey L. Harris, Monroeton, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 1, 1978, Ser. No. 882,076

Int. Cl.[3] B32B *5/22, 15/02, 15/08, 15/16, 27/04*

U.S. Cl. 428—212 **22 Claims**



1. A self-supporting flexible bilayered sheet comprising a base layer and a top layer, the base layer comprising abrasive particles distributed in and supported by a volatilizable organic binder matrix, the top layer comprising metallic matrix particles distributed in and supported by a volatilizable organic binder matrix, the matrix particles having a melting point greater than the volatilization temperature of the organic binder, but less than the melting point of the abrasive particles, characterized in that said binder comprises from about 53 to 58.5 weight percent of polyvinyl butyral, 39.5 to 43.8 weight percent of a phthalate plasticizer and 2.0 to 2.7 weight percent of a deflocculant.

12. A method for forming a self-supporting flexible bilayered sheet comprising a base layer and a top layer, the method comprising:

(a) forming a solution of an organic binder in an organic solvent, the binder comprising from 53 to 58.5 weight percent of polyvinyl butyral, 39.5 to 43.8 weight percent of a phthalate plasticizer and 2.0 to 2.7 weight percent of a deflocculant;

(b) forming first and second slurries of abrasive particles and metallic matrix particles in said solution, respectively;

(c) tape casting said first and second slurries;

(d) removing the organic solvent from the tape cast layers to leave first and second flexible self-supporting sheets; and

(e) attaching the second sheet to the top of the first sheet to form a flexible self-supporting bilayered sheet.

4,228,215

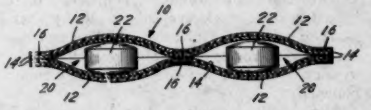
LAMINATE INCLUDING FLUID COMPRESSION ROLLED POLYMER

Carl C. Hein, III, Neenah, Wis.; Russell J. Lempke, Cleveland, Ohio; Harold K. Silver; Joseph J. Spitz, both of Neenah, Wis., and Don W. Seidler, Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Filed Jun. 30, 1978, Ser. No. 920,710

Int. Cl.[2] B32B *7/02, 27/32, 27/40*

U.S. Cl. 428—216 **10 Claims**



1. A biaxially tearable laminate having a low moisture vapor transmission rate, comprising:

(a) a fluid compression rolled, uniaxially oriented base film about 0.5 to 2.5 mils thick comprised of at least a major proportion of high density polyethylene, said base film

having, in the direction of the axis of orientation, a tensile strength of at least about 15,000 pounds per square inch, an elongation value of less than about 150 percent, and a tear strength of about 5 to 100 grams, having, in the direction transverse to the direction of orientation, a tensile strength of about 2000 to 6000 pounds per square inch, an elongation value of less than about 75 percent, and a tear strength greater than about 500 grams, and having a moisture vapor transmission rate of less than 0.2 gram per 100 square inches per 24 hours; and

(b) a substantially unoriented heat seal film of synthetic resinous polymer bonded in full surface contact to said base film in a thickness ratio of heat seal film to base film of about 0.5–1.5:1.0, said heat seal film having a sealing temperature which is significantly less than that of said base film and which is below the temperature at which substantial deorientation occurs in said base film, having a tensile strength of less than about 12,000 pounds per square inch, and having an elongation value of at least 75 percent; said laminate having, in said base film orientation direction, a tensile strength of at least about 11,000 pounds per square inch and a tear strength of less than about 175 grams, having, in said base film transverse direction, an elongation value of at least about 100 percent and a tear strength of less than about 450 grams, and having a moisture vapor transmission rate of less than about 0.2 gram per 100 square inches per 24 hours.

4,228,216

PRODUCTION OF RADIATION CURABLE MICROCAPSULAR COATING COMPOSITIONS, PRESSURE-SENSITIVE TRANSFER PAPER AND ITS PRODUCTION

Robert A. Austin, and Dale R. Shackle, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 811,556, Jun. 30, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,376

Int. Cl.[3] **B32B** *3/26;* **B05D** *3/06;* **B41M** *3/12;* **C09D** *11/00*

U.S. Cl. 428—307 **13 Claims**

9. A process for producing a pressure-sensitive transfer paper comprising the steps of:

(a) preparing an emulsion containing droplets of a hydrophobic emulsion component dispersed in a hydrophilic emulsion component, said hydrophobic emulsion component comprising a chromogenic material in a hydrophobic liquid, said chromogenic material being soluble in said hydrophobic liquid, said hydrophobic emulsion component additionally containing a first wall-forming material capable of reacting by condensation polymerization with a second wall-forming material to form a polymeric capsule wall, said first wall-forming material being soluble in said hydrophobic emulsion component, said polymeric capsule wall being substantially insoluble in said hydrophilic and said hydrophobic emulsion components, said hydrophilic emulsion component comprising an emulsifier dispersed in a radiation curable hydrophilic liquid, said radiation curable liquid comprising water and at least one radiation curable polar component, said emulsion additionally containing said second wall-forming material;

(b) subjecting said emulsion, with mixing, to temperature conditions for a period of time sufficient to polymerize said first and second wall-forming materials thereby forming a dispersion of microcapsules in said hydrophilic emulsion component, said microcapsules having a hydrophobic core material and capsule walls substantially impermeable to said hydrophilic and said hydrophobic emulsion components;

(c) adding a photoinitiator to said dispersion of microcapsules;

(d) applying said dispersion of said microcapsules to a paper substrate; and

(e) setting said dispersion of said microcapsules by subjecting said dispersion on said paper substrate to radiation for a period of time sufficient to cure said radiation curable hydrophilic liquid to a dry, solid, tack-free resinous film on said paper substrate, said radiation being a combination of ultraviolet radiation and infra-red radiation.

11. The process of claim 9 wherein said combination of ultraviolet radiation and infra-red radiation is obtained from a mercury vapor lamp.

13. A pressure-sensitive carbonless transfer paper prepared by the process of claim 11.

4,228,217

LUBRICANT FOR METAL STRIP

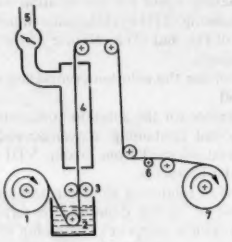
Rudolf Baur, Kreuzlingen, Switzerland, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Division of Ser. No. 936,828, Aug. 25, 1978, Pat. No. 4,193,881. This application Apr. 18, 1979, Ser. No. 31,220

Claims priority, application Switzerland, Sep. 6, 1977, 10845/77

Int. Cl.[3] **B21B** *45/02;* **B32B** *15/20*

U.S. Cl. 428—409 **11 Claims**



1. Metal strip, in particular for the production of containers, wherein at least one side of the metal strip is coated with a lubricant which has as its main constituent a minimum of 60% of a salt selected from the group consisting of the aluminum salt of a saturated C_{11} to C_{19} monocarboxylic acid, the magnesium salt of a saturated C_{11} to C_{19} monocarboxylic acid, and mixtures thereof, wherein said strip is suitable for coating or laminating one or both sides.

4,228,218

POLYMER COMPOSITE MATERIAL

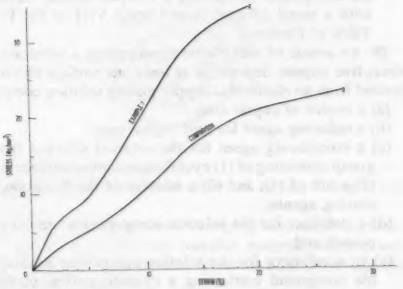
Motowo Takayanagi, No. 20-20, Chuokutani 2-chome, Fukuoka-shi, Fukuoka, Japan, and Tisato Kajiyama, Fukuoka, Japan, assignors to Motowo Takayanagi, Fukuoka and Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, both of, Japan

Filed Nov. 6, 1978, Ser. No. 958,324

Claims priority, application Japan, Nov. 4, 1977, 52-131436

Int. Cl.[3] **B32B** *9/04, 27/08, 27/40*

U.S. Cl. 525—58 **19 Claims**



1. A polymer composite material which comprises

a first rigid polymeric material composed substantially of rigid molecular chains having an average chain length of 50 A or more, and comprising at least one member selected from the group consisting of poly(p-phenylene terephthalamide); copolymers prepared by substituting a portion of the poly(p-phenylene terephthalamide) with 2,6-naphthalene or p,p'-biphenyl, poly(p-benzamide); aromatic polyesters prepared from a halogenated hydroquinone, a methylhydroquinone or 2,6-dihydroxynaphthalene and terephthalic acid; aromatic poly-Schiff bases prepared from 2-methyl-p-phenylenediamine and terephthalaldehyde and copolymers thereof; N-substituted nylon-1; poly(spiro-2,3-hepta-4,6-diene) and hydrogenated derivatives thereof; poly)terephthaloyl-p-aminobenzoylhydrazide; and polymers comprising a straight chain of poly-p-phenylene; and

a flexible second polymeric material composed substantially of flexible molecular chains and comprising at least one member selected from the group consisting of polyacrylonitrile and copolymers thereof; nylons 6, 66, 610 and 12; polyethylene terephthalate; poly-butylene terephthalate; polyethylene terephthalate-polybutylene terephthalate block copolymer; polyethylene terephthalate-polytetraemthylene glycol block copolymer; polyethylene terephthalate-polyethylene glycol block copolymer; polyurethane; segmented polyurethanes; polyethylene; polypropylene; polybutene; ethylene-propylene copolymer; polycarbonate; polyacetals; polysulfones; polyvinyl chloride and copolymers thereof; polyvinylidene chloride and derivatives thereof; polymethyl methacrylates; acrylate copolymer elastic materials; polystyrene; acrylonitrilestyrene copolymer; acrylonitrile-styrene-butadiene copolymer; polyvinyl acetates; polyvinyl formal; polyvinyl acetal; polyvinyl butyral; ethylene-vinyl acetate copolymers; ethyleneacrylate copolymers and hydrolyzed products thereof; polyvinyl alcohols; and styrene-butadiene block copolymers, wherein said first rigid polymeric material is present in an amount of 20% or less based on the total weight of polymeric material in said composite and said first material is uniformly dispersed in said second polymeric material in a microscopic region of 1 μm or less.

4,228,219

AROMATIC POLYETHER SULFONE USED AS A PRIME COAT FOR A FLUORINATED POLYMER LAYER

Leslie R. J. Hoy, St Neots, and Malcolm J. Saggers, Cheshunt, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 26, 1979, Ser. No. 33,715
Int. Cl.[2] B05D *1/36, 3/02, 5/08;* **B32B** *27/08*
U.S. Cl. 428—422 **8 Claims**

1. A method of coating a substrate surface, which method comprises:

(a) applying a primer composition to the substrate surface which primer composition comprises thermoplastic polymeric material dispersed in an inert liquid diluent, at least 50% by weight of said thermoplastic polymeric material being constituted by at least one thermoplastic aromatic polyethersulphone;

(b) before the applied primer composition has become touch-dry, applying a dispersion of a tetrafluoroethylene polymer top-coat material in an inert liquid diluent over the coated substrate; and

(c) removing the inert liquid diluent or diluents and sintering the combined coating of the primer and top-coat layers.

7. A coated article which comprises at least one substrate surface which has adhering thereto a combined coating of a primer layer derived from a primer composition which comprises thermoplastic polymeric material dispersed in an inert liquid diluent, at least 50% by weight of said thermoplastic polymeric material being constituted by at least one thermoplastic aromatic polyethersulphone, and a top-coat layer derived from a tetrafluoroethylene polymer dispersion.

4,228,220

SELECTIVE ABSORBER ON GLASS AND METHOD FOR ITS PRODUCTION

John D. Garrison, 5607 Yerba Anita Dr., San Diego, Calif. 92115

Filed Jun. 28, 1978, Ser. No. 920,073
Int. Cl.[3] C25D *5/54, 5/10*
U.S. Cl. 428—434 **10 Claims**

1. A method for producing a composite layer on a glass substrate for selectively absorbing solar radiation, the composite layer and glass substrate having a coefficient of solar absorption greater than 0.70 and an infrared emittance less than 0.20, comprising the steps of:

(a) cleaning the glass substrate;

(b) chemically depositing a layer of silver metal on the glass substrate by exposing the glass substrate to simultaneous sprays of a silvering solution and a reducing solution until said layer of silver metal achieves a thickness on the order of 0.10 microns;

(c) electroplating a layer of black nickel over the layer of silver by preparing a black nickel plating solution, bringing the plating solution to a temperature of between 20 and 53 degrees centigrade, submerging the glass substrate with the layer of chemically deposited silver into the plating solution, and applying electrical potential between the layer of deposited silver and an anode submerged in the black nickel plating solution until the layer of black nickel has achieved a thickness of between 0.02 and 0.5 microns; and

(d) heat treating said glass substrate and composite layer of silver and black nickel in a vacuum of about 20 microns or less and a temperature of about 200 to 600 degrees centigrade for about 2 to 24 hours.

4,228,221

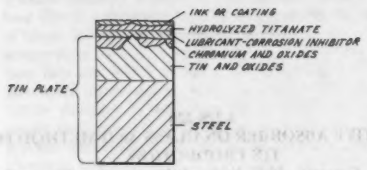
PRIMER SYSTEM

Stanley E. Rohowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 4, 1979, Ser. No. 26,906
Int. Cl.[2] B05D *3/06*
U.S. Cl. 428—469 **16 Claims**

1. An applied primer covering a lightly lubricated metal

substrate including various metals and their oxides to form a surface for receiving a subsequently applied coating said



primer consisting essentially of a thin film of organic titanate treated momentarily with ultraviolet radiation.

4,228,222

HEAT-SENSITIVE RECORD MATERIAL

Takeshi Murakami, Osaka; Teruo Nakamura, and Hisanori Yagi, both of Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,866

Claims priority, application Japan, Mar. 28, 1978, 53-36397

Int. Cl.[2] B32B *27/00*; B41M *5/18*

U.S. Cl. 428—500 **14 Claims**

1. In a heat-sensitive record material comprising a base sheet and a color developing layer formed on at least one surface of said base sheet, said color developing layer comprising electron donating color forming material and acceptor which is reactive with said color forming material to develop a color, the improvement in said color developing layer further including as a binder water soluble resinous material having carboxyl radicals, at least 35% of said carboxyl radicals neutralized by alkaline materials to form magnesium salt and at least one other salt which is a member selected from the group consisting of sodium salt, potassium salt, ammonium salt and amine salt, 30 to 80% of the total carboxyl radicals existing in the form of magnesium salt and 5 to 70% of the total carboxyl radicals existing in the form of said other salt; wherein said water soluble resinous material having carboxyl radicals comprises a copolymer made by copolymerization of at least one ethylenic monomer, at least one conjugated diolefinic monomer and at least one unsaturated carboxylic acid; and wherein said unsaturated carboxylic acid component comprises 30 to 70% by weight of said copolymer.

4,228,223

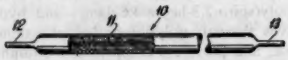
WEAR AND CORROSION RESISTANT NICKEL-BASE ALLOY

Otto Knotek, Aachen, Fed. Rep. of Germany; Erich Lugscheider, Vaals, Netherlands, and Wolfgang Wichert, Aachen, Fed. Rep. of Germany, assignors to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 784,376, Apr. 4, 1977, Pat. No. 4,118,254. This application Mar. 1, 1978, Ser. No. 882,356

Int. Cl.[2] B22F *7/04*

U.S. Cl. 428—558 **3 Claims**



1. A weld rod consisting essentially of a nickel tube with a metallic powder contained within said tube, such that a melt produced therefrom consists essentially of a nickel-base wear and corrosion resistant alloy containing by weight about 20% to 35% Cr, about 1% to 8% Si, about 1.7% to 3.5% C, 0 to 15% W and the balance essentially at least about 40% nickel,

the amount of carbon present being stoichiometrically related to the chromium content to provide carbides based on the formula M_7C_3,

wherein M comprises essentially chromium, the amount of chromium in said M_7C_3 compound ranging from about 65% to less than about 100% of the total chromium content in said composition,

the melting point of said alloy being less than about 1350° C. said alloy having a composition such that segregation of said alloy upon changing from the molten to the solid state is substantially inhibited.

4,228,224

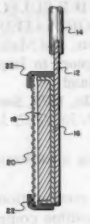
POSITIVE ELECTRODE FOR ELECTRICAL ENERGY STORAGE DEVICE

Laszlo A. Heredy, Canoga Park, and Lowell R. McCoy, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 12, 1979, Ser. No. 29,592

Int. Cl.[2] H01M *6/20*

U.S. Cl. 429—112 **15 Claims**



1. In a rechargeable electrical energy storage device including a lithium halide-containing salt electrolyte which is molten at the operating temperature of the device, and electropositive and electronegative electrode structures spaced apart in said electrolyte, the improvement wherein said electropositive electrode structure comprises:

a housing for containing a body of electropositive active material, said housing having at least one open face;

an electrolyte-permeable member affixed to said housing and

covering said open face for retaining said active material in said housing; and

said housing and electrolyte-permeable member comprising a material selected from the group consisting of steel, nickel, copper and alloys thereof having at least a 0.3/1000ths of an inch thick electroless nickel coating thereon, said electroless nickel coating being selected from the group consisting of nickel phosphide and nickel boride.

4,228,225

BATTERY SEPARATOR

Dennis D. O'Rell, Boxboro, and Nan J. Lin, Burlington, both of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jun. 22, 1979, Ser. No. 51,175
Int. Cl.[2] H01M *2/18*
U.S. Cl. 429—147 **29 Claims**

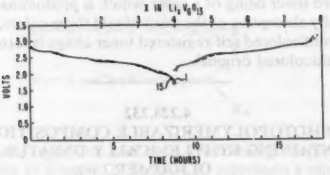
1. In a battery separator comprising a porous sheet having at least one positive plate engaging face having a top and a bottom and at least one negative plate engaging face having a top and a bottom, said sheet being embossed to provide a reverse configuration of embossment on said positive plate engaging face and said negative plate engaging face, the improvement comprising having essentially all embossment walls opening continuously upwardly in the battery plate engagement areas and at least some of said embossment walls formed into a configuration angled from the vertical and comprising gas impeding restrictions on at least one of said faces, all restrictions being penetrated from their lower surface at its upper extremity.

4,228,226

NONAQUEOUS SECONDARY CELL USING VANADIUM OXIDE POSITIVE ELECTRODE

Paul A. Christian, Princeton; Francis J. Di Salvo, Jr., Florham Park, and Donald W. Murphy, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 10, 1978, Ser. No. 950,130
Int. Cl.[3] H01M *10/40*
U.S. Cl. 429—194 **8 Claims**



1. A nonaqueous secondary cell comprising a negative electrode of lithium metal, an electrolyte and a positive electrode: CHARACTERIZED IN THAT said positive electrode comprises at least one vanadium oxide selected from the group consisting of $VO_2(B)$ and vanadium oxides having the nominal stoichiometry VO_{2+y}; y greater than 0.0 and less than or equal to approximately 0.4.

4,228,227

RECHARGEABLE ELECTROCHEMICAL CELL

Deidrich J. Saathoff, Eagan, and Hanumanthiyna V. Venkatasetty, Burnsville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 13, 1979, Ser. No. 66,154
Int. Cl.[3] H01M *10/40*
U.S. Cl. 429—194 **5 Claims**

1. An electrolyte for use in rechargeable electrochemical cells having a lithium and a depolarizer, comprising:

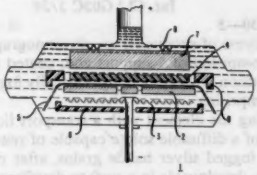
an electrochemically active amount of $LiAsF_6$ dissolved in tetrahydrofuran and a rechargeability improving amount of LiI contained therein to form an electrolyte solution, said solution being capable of passing through a molecular sieve on less than 5 Angstroms.

4,228,228

ELECTRODE STRUCTURE FOR ENERGY CELLS

Richard L. Beauchamp, Whitefish Bay, Wis., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 4, 1979, Ser. No. 81,939
Int. Cl.[3] H01M *6/14*
U.S. Cl. 429—194 **10 Claims**



1. An energy cell comprising electrolyte, electrolyte solvent and electrodes, at least one of said electrodes comprising active material and binder; characterized in that said binder comprises copolymer with from about 40 to 60 mole percent of ethylene comonomer and from about 40 to 60 mole percent of halogenated ethylene comonomer in which the halogenated ethylene comonomer is comprised of at least one substance selected from the group consisting of tetrafluoroethylene and chlorotrifluoroethylene.

4,228,229

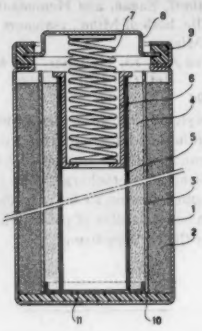
LITHIUM PRIMARY CELL CONTAINING THIONYL CHLORIDE

Jean-Paul Gabano, Poitiers, and Jean-Yves Grassien, Gizay par La Villedieu du Clain, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 18, 1979, Ser. No. 4,544
Claims priority, application France, Jan. 31, 1978, 78 02601; Feb. 17, 1978, 78 04530
Int. Cl.[3] H01M *6/14*
U.S. Cl. 429—196 **15 Claims**

1. An electrochemical primary cell whose negative active material is lithium, whose positive active material includes thionyl chloride, and whose electrolyte consists essentially of a solution of, as a solute, a complex salt resulting from the reac-

tion of aluminum chloride with an ionisable compound selected from the group consisting of lithium oxide (Li_2O), cal-



cium oxide (CaO), and barium oxide (BaO), dissolved in thionyl chloride.

4,228,230

ULTRASONIC IMAGING OF INTERNALLY FOGGED SILVER HALIDE ELEMENTS

Robert B. Rosenfeld, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,571
Int. Cl.[3] G03C *5/24*
U.S. Cl. 430—3 **18 Claims**

1. A process of producing an ultrasonographic image in an element comprised of a support and, coated thereon, a silver halide emulsion layer containing internally fogged silver halide grains, comprising

contacting the element with a transport liquid in the presence of a diffusible solute capable of rendering the internally fogged silver halide grains, after contact with the solute, developable in a surface developer,

exposing the element to ultrasound in an image pattern to accelerate imagewise diffusion of the solute into contact with the internally fogged silver halide grains and

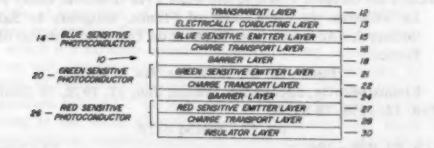
developing the internally fogged silver halide grains contacted with the solute in response to ultrasound exposure to produce a visible image defined by the imagewise pattern of ultrasonic exposure.

4,228,231

COLOR ELECTROPHOTOGRAPHIC PROCESS, APPARATUS AND RECORDING ELEMENT USEFUL THEREIN

Joseph Y. Kaukeinen, and Ernest W. Turnblom, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 695,351, Jun. 14, 1976, abandoned.
This application Oct. 31, 1977, Ser. No. 847,464
Int. Cl.[2] G03G *13/01, 13/24*
U.S. Cl. 430—46 **17 Claims**


TRANSPARENT LAYER — 12
ELECTRICALLY CONDUCTING LAYER — 13
14 — BLUE SENSITIVE PHOTOCONDUCTOR
BLUE SENSITIVE EMITTER LAYER — 15
CHARGE TRANSPORT LAYER — 16
10
BARRIER LAYER — 18
20 — GREEN SENSITIVE PHOTOCONDUCTOR
GREEN SENSITIVE EMITTER LAYER — 21
CHARGE TRANSPORT LAYER — 22
BARRIER LAYER — 24
26 — RED SENSITIVE PHOTOCONDUCTOR
RED SENSITIVE EMITTER LAYER — 27
CHARGE TRANSPORT LAYER — 28
INSULATOR LAYER — 30

1. A process for producing a multicolored image from a multicolored original comprising the steps of:

(a) providing a recording element comprising (1) an electrically conducting layer, (2) a first photoconductive layer conductively sensitive to light of substantially only a first color and substantially transparent to light of other colors, (3) a second photoconductive layer conductively sensitive to light of a second color and substantially transparent to at least light of a third color, (4) a third photoconductive layer conductively sensitive to light of a third color and (5) an electrically insulating layer, said photoconductive layers and said electrically conducting layer being disposed so as to allow charge migration therebetween and at least one of said conducting and insulating layers being substantially transparent to light in the visible region of the spectrum, said process comprising the steps of:

(b) uniformly electrostatically charging said recording element across said photoconductive and insulating layers;

(c) imagewise exposing the recording element to the multicolored original, such imagewise exposure being effected through said transparent layer using an exposure source comprising light of said first, second and third colors, to thereby form a charge distribution pattern across said photoconductive and insulating layers which is representative of the various colors comprising the original;

(d) uniformly flooding said recording element through said transparent layer with light of a color to which one of said three photoconductive layers is responsive at an intensity sufficient to discharge such layer;

(e) applying a first electroscopic toner to said insulating layer while simultaneously establishing a first biasing electrical potential relative to said conducting layer to produce a first toner image on said insulating layer, said first toner being of a color which is predominantly spectrally absorptive of one of said three colors;

(f) uniformly flooding said recording element through said transparent layer with light of a color to which at least one of said photoconductive layers is responsive and at least one of said photoconductive layers is unresponsive at an intensity sufficient to discharge said responsive layer, said responsive layer and said unresponsive layer comprising the two photoconductive layers which remained charged in step (d);

(g) applying a second electroscopic toner to said insulating layer while simultaneously establishing a second biasing electrical potential relative to said conducting layer to produce a second toner image on said insulating layer which is superimposed on said first toner image, said second toner being of a color which is predominantly spectrally absorptive of another of said three colors;

(h) uniformly flooding said recording element through said transparent layer with light of a wavelength and at an intensity sufficient to discharge at least said photoconductive layer which remained charged in step (f); and

(i) applying a third electroscopic toner to said insulating surface while simultaneously establishing a third biasing electrical potential relative to said conductive layer to produce a third toner image on said insulating layer which is superimposed on said first and second toner images, said third toner being of a color which is predominantly spectrally absorptive of the third of said three colors, whereby a multicolored self-registered toner image is formed of the multicolored original.

4,228,232

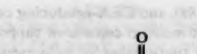
PHOTOPOLYMERIZABLE COMPOSITION CONTAINING ETHYLENICALLY UNSATURATED OLIGOMERS

Alan D. Rousseau, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 901,480, May 1, 1978, abandoned. This application Feb. 27, 1979, Ser. No. 15,586
Int. Cl.[3] G03C *1/68, 1/94*
U.S. Cl. 430—271 **68 Claims**

1. A photopolymerizable composition comprising

(1) 10% to 60% by weight of an oligomer of the formula



wherein

E is an ethylenically unsaturated, free radical polymerizable group,

D is the residue of a polyisocyanate having at least two of its isocyanate groups reacted to form

groups bonded to E and R,

R is the residue of a polyol having at least a +b hydroxyl groups, the residue formed by removal of hydrogen from the hydroxyl groups, said polyol having a number average molecular weight between 90 and 10,000,

A is a carboxylic acid containing group,

a is a number having an average value between 2 and 20, and

b is a number having an average value between 0.3 and 10,

(2) 10% to 60% by weight of an organic film forming polymer having a molecular weight of at least 6,000,

(3) 10% to 60% by weight of a free radical polymerizable monomer having at least one ethylenically unsaturated group, and

(4) 0.1% to 12% by weight of a photoinitiator system capable of initiating free radical polymerization upon absorption of electromagnetic radiation.

4,228,233

PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Morio Yagihara, and Yukio Yokota, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

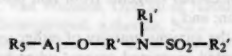
Filed Sep. 22, 1978, Ser. No. 944,834

Claims priority, application Japan, Sep. 22, 1977, 52/114268

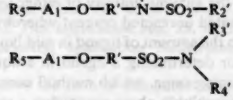
Int. Cl.³ G03C 7/00

U.S. Cl. 430—385 **9 Claims**

7. A method of forming an image comprising exposing a silver halide light-sensitive photographic material comprising a support having thereon at least one silver halide emulsion layer and developing said exposed silver halide photographic material with a developer containing an aromatic primary amine developing agent in the presence of at least one cyan dye-forming colorless photographic coupler residue containing an α-naphthol nucleus having, at the coupling position, an alkoxy group having at lease one sulfonamido or sulfamoyl group as a substituent and represented by the following general formula (III) or (IV):

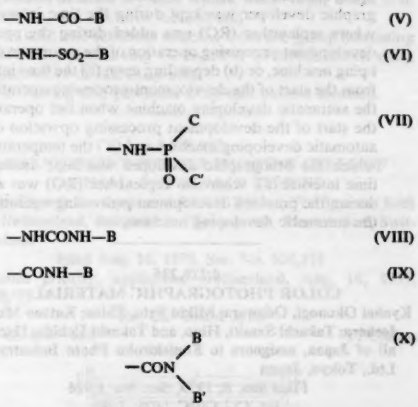


(III)



(IV)

wherein A_1 represents said cyan dye-forming coupler residue containing an α-naphthol nucleus; R′ represents a saturated or unsaturated divalent aliphatic group; wherein R'_1 represents a hydrogen atom, an alkyl group containing up to 7 carbon atoms, an alkenyl group containing up to 7 carbon atoms, an aralkyl group with 7 carbon atoms, or an aryl group with 6 to 12 carbon atoms; and R_2 represents an alkyl group containing up to 18 carbon atoms, an alkenyl group containing up to 18 carbon atoms, an aralkyl group containing up to 18 carbon atoms, an aryl group containing 6 to 12 carbon atoms or a heterocyclic group selected from the class consisting of a thiazolyl, a benzothiazolyl, an oxazolyl, a pyridyl, a 1,2,4-triazolyl, a pyrazolyl, a benzimidazolyl and a imidazolyl group; R'_3 and R'_4, which may be the same or different, each represents a hydrogen atom, an alkyl group containing up to 18 carbon atoms, an alkenyl group containing up to 18 carbon atoms, an aralkyl group containing 7 to 18 carbon atoms, an aryl group containing 6 to 12 carbon atoms; and R_3 and R_4 can combine and form a ring selected from the class consisting of a piperadine, a pyrrolidine, a pyrrole, a morpholine, an imidazole, a benzimidazole, a 1,2,4-triazole, a 1,2,3-triazole and a benzotriazole ring, R_5 represents a hydrogen atom, an aliphatic group containing up to 30 carbon atoms, an alkoxy group containing up to 30 carbon atoms, an aryloxy group, an acylamido group, a sulfonamido group, a phosphoramido group, a ureido group, or a carbamyl group, each represented by the general formula (V) to (X):



(V)

(VI)

(VII)

(VIII)

(IX)

(X)

wherein B and B′, which may be the same or different, each represents an aliphatic group containing 1 to 32 carbon atoms, a cycloalkyl group or an aryl group, wherein the alkyl group and the aryl group may be substituted with one or more of a hydrogen atom, a nitro group, a cyano group, a hydroxyl group, a carboxy group, an amino group, an alkyl group, an aryl group, an alkoxycarbonyl group, an acyloxycarbonyl group, an amido group, an imido group, a carbamoyl group, an alkoxy group, or an aryloxyl group; and C and C′, which may be the same or different, each represents the groups described for B and additionally an —N—OB group, an —NH—B group, or an $—NB_2$ group.

4,228,234

METHOD FOR MAINTAINING THE DEVELOPMENT ACTIVITY OF A PHOTOGRAPHIC LITHOGRAPHIC DEVELOPER CONSTANT

Eiichi Okutsu, and Katsumi Hayashi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 30, 1978, Ser. No. 873,751

Claims priority, application Japan, Jan. 28, 1977, 52-8520; Feb. 15, 1977, 52-15117

Int. Cl.² G03C 5/30

U.S. Cl. 430—399 **8 Claims**

1. In a method for processing silver halide lithographic photosensitive materials with a lightographic developer using an automatic developing machine, the improvement comrising maintaining constant the development activity of the lithographic developer by adding supplemental amounts of two kinds of replenishers to the lithiographic developer with a replenisher (RD) being employed to compensate for the decrease in the development activity of the lithographic devel-

oper resulting from the development-processing of lithographic photosensitive materials and a replenisher (RO) being employed to compensate for the decrease in the development activity of the lithographic developer resulting from the passage of time, where replenishers (RD) and (RO) differ in free sulfite ion concentrations, bromide ion concentrations and pH, wherein the method comprises adding replenisher (RD) during the development-processing operation in a supplemental amount in proportion to the size of the film processed, the degree of exposure of the film processed and the percentage of the exposed area of the film processed and, prior to the start of each development-processing operation, adding replenisher (RO) in a supplemental amount previously determined

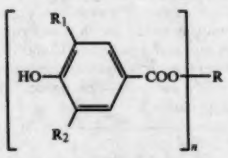
(a) depending upon (i) the time interval from the suspension of the development-processing operation of the automatic developing machine when last operated to the start of the development-processing operation of the automatic developing machine and (ii) the temperature at which the lithographic developer was kept during the time interval (i), where replenisher (RO) was added during the previous development-processing operation of the automatic developing machine, or (b) depending upon (i') the time interval from the start of the development-processing operation of the automatic developing machine when last operated to the start of the development processing operation of the automatic developing machine and (ii') the temperature at which the lithographic developer was kept during the time interval (i'), where no replenisher (RO) was added during the previous development-processing operation of the automatic developing machine.

4,228,235
COLOR PHOTOGRAPHIC MATERIAL

Kyohei Okonogi, Odawara; Mikio Sato, Ebina; Katsuo Mogaki, Isehara; Takashi Sasaki, Hino, and Takashi Uchida, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1979, Ser. No. 1,926
Int. Cl.[2] G03C 1/06, 7/00
U.S. Cl. 430—542 **7 Claims**

1. A color photographic material comprising a support and a light sensitive silver halide emulsion layer thereon, which material comprises a compound represented by the folllowing formula:



(I),

where R_1 and R_2 individually represent an alkyl group, R represents a n-valent organic group selected from the group consisting of an aliphatic, cycloaliphatic and aromatic group and n is an integer from 1 to 6.

4,228,236
PROCESS OF PRODUCING CARCINOEMBRYONIC ANTIGEN

Milda M. Jakstys, Chicago, Ill.; Baldwin H. Tom, and Barry D. Kahan, both of Houston, Tex., assignors to Northwestern University, Evanston, Ill.

Continuation of Ser. No. 785,565, Apr. 7, 1977, abandoned. This application May 15, 1978, Ser. No. 906,036
Int. Cl.[2] C12K 9/00
U.S. Cl. 435—1 **5 Claims**

1. The process of producing carcinoembryonic antigen (CEA) in vitro, comprising culturing cells selected from the cell lines consisting of LS-180 (ATCC No. CL-187), LS-174T (ATCC No. CL-188), and CEA-producing cells derived therefrom, in a nutrient medium capable of supporting the growth of said cells until the number of cells present have at least doubled, and recovering the CEA thus produced.

4,228,237
METHODS FOR THE DETECTION AND DETERMINATION OF LIGANDS

Richard C. Hevey, Rockport, Me., and Mark K. Malmros, Newton, Pa., assignors to Calbiochem-Behring Corp., La Jolla, Calif.

Filed Sep. 21, 1978, Ser. No. 944,254
Int. Cl.[2] C12Q 1/66
U.S. Cl. 435—7 **28 Claims**

1. A method of determining a ligand in a liquid medium suspected of containing same, which method comprises:

(a) providing an insoluble phase containing a specific binding substance for said ligand;

(b) incubating said insoluble phase with the following reagents:

(i) liquid medium suspected of containing said ligand;

(ii) biotin labeled specific binding substance for said ligand; and

(iii) enzyme labeled avidin;

(c) separating unreacted reagents from said insoluble phase after incubation; and

(d) determining the enzyme activity of either said insoluble phase or separated unreacted reagent whereby said activity is related to the amount of ligand in said liquid medium.

7. A method for determining a ligand in a liquid medium suspected of containing same, which method comprises:

(a) providing an insoluble phase containing a specific binding substrate for said ligand;

(b) incubating said insoluble phase with the following reagents:

(i) liquid medium suspected of containing said ligand; and

(ii) biotin labeled specific binding substance for said ligand bound to enzyme labeled avidin;

(c) separating unreacted reagents from said insoluble phase after incubation; and

(d) determining the enzyme activity of either said insoluble phase or separated unreacted reagent whereby said activity is related to the amount of ligand in said liquid medium.

16. A method for determining a ligand in a liquid medium suspected of containing same, which method comprises:

(a) providing an insoluble phase containing a specific binding substance for said ligand;

(b) incubating said insoluble phase with the following reagents:

(i) (A) liquid medium suspected of containing said ligand and (B) a known quantity of biotin labeled ligand; and

(ii) enzyme labeled avidin;

(c) separating unreacted reagents from said insoluble phase after incubation; and

(d) determining the enzyme activity of either said insoluble phase or separated unreacted reagent whereby said activity is related to the amount of ligand in said liquid medium.

22. A method for determining a ligand in a liquid medium suspected of containing same, which method comprises:

(a) providing an insoluble phase containing a specific binding substance for said ligand;

(b) incubating said insoluble phase with a reagent comprising (A) liquid medium suspected of containing said ligand and (B) a known quantity of biotin labeled ligand bound to enzyme labeled avidin;

(c) separating unreacted reagent from said insoluble phase after incubation; and

(d) determining the enzyme activity of either said insoluble phase or separated unreacted reagent whereby said activity is related to the amount of ligand in said liquid medium.

4,228,238

METHOD OF LABORATORY TESTING IN WATER-BASED CULTURE MEDIA FOR ZONES OF INHIBITION

Damon Swanson, Denver, Colo., assignor to The Allor Foundation, Boston, Mass.

Filed Aug. 23, 1979, Ser. No. 68,751
Int. Cl.[3] C12K 1/04
U.S. Cl. 435—32 3 Claims

1. A method of enabling zone of inhibition testing of essential oil extracts with non-miscible oil-based culture media and the like, that comprises, mixing said essential oil extracts with an alcohol that, in relatively dilute concentration, does not demonstrate substantial anti-microbial activity, to form an emulsion containing an extraction of the same materials; diluting the alcohol emulsion with water sufficient to bring the alcohol to said relatively dilute concentration of non-anti-microbial activity; saturating a sensitivity disc with a sample of the diluted emulsion after contacting the disc with a water-based culture medium; evaporating the alcohol saturated into the disc; inverting and incubating the culture medium carrying the disc; and observing zones of inhibition produced on the disc as a result of miscible reaction with the water-based culture medium of the alcohol-extracted originally non-miscible essential oil extracts.

4,228,239

METHOD FOR PRODUCING ANTIBIOTIC C-15003 P-3

Eiji Higashide, Takarazuka; Kazunori Hatano, and Mitsuko Asai, both of Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd, Osaka, Japan

Filed Nov. 13, 1978, Ser. No. 959,602
Claims priority, application Japan, Nov. 18, 1977, 52/139385
Int. Cl.[3] C12P 17/18
U.S. Cl. 435—119 3 Claims

1. In a method for producing Antibiotic C-15003 P-3 by cultivating a microorganism belonging to the genus Nocardia and being capable of producing Antibiotic C-15003 P-3 in a culture medium containing assimilable carbon sources, and digestible nitrogen sources, wherein the improvement comprises incorporating about 0.01 to 1% by weight based on the volume of the culture medium of valine, isobutyric acid, α-ketoisovaleric acid or its salt or ester, amide or salt of valine or isobutyric acid as additive substances into the culture medium.

4,228,240

STABILIZATION OF PEROXIDASE

Edward C. Dawson, Berghem; Jan D. H. Homan, Oss, and Bauke K. Van Weemen, Oss, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 831,817, Sep. 9, 1977, Pat. No. 4,169,012. This application Jan. 25, 1979, Ser. No. 6,934
Claims priority, application Netherlands, Sep. 24, 1976, 7610608
The portion of the term of this patent subsequent to Sep. 25, 1996, has been disclaimed.
Int. Cl.[2] C07G 7/02; G01N 31/14
U.S. Cl. 435—188 12 Claims

5. An aqueous composition for use in enzyme immunoassay tests, consisting essentially of:

a peroxidase present from about 1 nanogram per milliliter to 25 micrograms per milliliter; and one or more polyvalent metal ions selected from the group consisting of Mg, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, and Al, wherein the ion is present in an amount of at least 0.0001 M.

4,228,241

METHOD FOR PRODUCING A PEPTIDASE

Hirofumi Hiraga, Kanagawa; Ryuichi Miyajima, and Koji Mitsugi, both of Yokohama, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Mar. 24, 1978, Ser. No. 889,877
Claims priority, application Japan, Mar. 28, 1977, 52-34295
Int. Cl.[2] C12N 9/48
U.S. Cl. 435—212 9 Claims

1. A method for producing a peptidase capable of substantially completely hydrolyzing protein into its constituent amino acids which comprises culturing a strain of filamentous fungus, belonging to one of the species *Aspergillus oryzae* and *Aspergillus sojae* and characterized in that said strain is capable of producing said peptidase, in a nutrient culture medium containing

(a) a protein selected from the group consisting of soybean protein, defatted soybean, wheat, wheat bran, wheat bran extract, and mixtures thereof, and

(b) at least one substrate selected from the group consisting of a fatty acid having 14, 16, 18 or 20 carbon atoms and a derivative of said fatty acid,

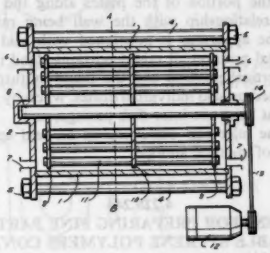
and recovering said peptidase from said culture medium.

4,228,242

ARRANGEMENT FOR CULTIVATING CELLS OF ANIMAL AND HUMAN TISSUES

Henry Girard, Burtigny, and Rudolf Bühler, Wolfhausen, both of Switzerland, assignors to Chemap AG, Maennedorf, Switzerland

Filed Aug. 16, 1978, Ser. No. 934,315
Claims priority, application Switzerland, Aug. 16, 1977, 10058/77
Int. Cl.[3] C12M 3/00
U.S. Cl. 435—284 11 Claims



1. An apparatus for cultivating cells of animal and human tissues, comprising a container which forms an inner chamber having an axis; means for introducing a nutrient medium into said inner chamber so as to at least partially fill the latter; a plurality of tubular cell supporting elements located in said chamber and extending substantially in an axial direction of the latter, each of said tubular cell supporting elements forming an inner passage and having an inner surface and an outer surface, the inner passage of each of said tubular cell supporting elements having an axis and two axially spaced open ends, so that the nutrient medium not only surrounds said tubular cell supporting elements from outside but also fills said inner passages, and cells are cultivated both on the inner surfaces and on the outer surfaces of said tubular cell supporting elements; means for rotating said tubular cell supporting elements about said axis of said inner chamber and including an axle defining said axis and connected with said tubular cell supporting elements for joint rotation therewith; and means for tilting said tubular cell supporting elements from the horizontal, so that one of said open ends of each of said inner passages is located above the other of said open ends, whereby the nutrient medium flows in each of said inner passages from said one end toward said other end, said tilting means including at least two discs

arranged for connecting and supporting said tubular cell supporting elements wherein said tubular cell supporting elements are loosely fixed in said discs on said axle, said discs being turnable about said axis of said inner chamber of said container in two mutually opposite directions so as to tilt said tubular cell supporting elements from the horizontal.

4,228,243

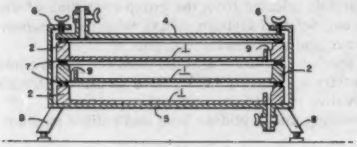
CELL CULTURE PROPAGATION APPARATUS

Masahiko Iizuka, Fujisawa, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 742,250, Nov. 16, 1976, abandoned. This application Jul. 13, 1978, Ser. No. 924,221

Int. Cl.[2] C12M *3/04*

U.S. Cl. 435—285 **1 Claim**



1. Apparatus for propagating tissue culture cells in a static culture system comprising:

a vessel reservoir for liquid culture medium, said vessel having four vertical walls at opposite ends of a first horizontal dimension thereof,

a plurality of substantially parallel spaced apart plates disposed within said vessel for providing surfaces to which cell growth can attach and liquid and gas phases can exist, said plates being enclosed and in sealing relationship with said vertical walls along three walls to form individual dishes, the portion of the plates along the wall not in sealing relationship with the wall being raised so that when the apparatus is positioned with said plates in a horizontal position all raised portions stand in a substantially vertical position and the liquid culture medium is maintained on said individual dishes, whereby said apparatus has at least one inter-dish passage, and

at least one inlet and outlet means on said apparatus for passage of medium and gas.

4,228,244

PROCESS FOR PREPARING FINE PARTICLE EXPANDABLE STYRENE POLYMERS CONTAINING SMALL CONCENTRATIONS OF ORGANIC BROMINE COMPOUNDS

Josef K. Rigler; Horst Leithäuser; Karl Trukenbrod, all of Marl, and Werner Ogrzewalla, Dorsten, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 29, 1979, Ser. No. 70,814

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1978, 2840355

Int. Cl.[2] C08J *9/12, 9/14, 9/16, 9/22*

U.S. Cl. 521—56 **10 Claims**

1. In a particulate molding composition for the production of foamed articles consisting essentially of a mixture of an expanding agent and a polymerized styrene monomer or styrene monomer in admixture with comonomers, the improvement comprising said composition containing about 0.00005 to 0.01 percent by weight based on said monomers and comonomers of organic bromine compounds which evidence a chain transfer constant of at least 200 and at 100° C. in bidistilled water said organic bromine compounds split off less than one molar % of hydrogen bromide per equivalent of bromine present in the molecule.

5. In a process for the preparation of shaped bodies based on expanded styrene polymers comprising: the polymerization of styrene or a mixture thereof with at least one monomer copolymerizable therewith, the addition of an expanding agent, pre-forming of the resulting expandable particles, ageing of the formed particles, and molding thereof in a pressure resistant mold, the improvement comprising: carrying out the polymerization in the presence of about 0.00005 to 0.01 percent by weight based on the weight of said styrene or mixture thereof of organic bromine compounds which evidence a chain transfer constant of at least 200 and at 100° C. in bidistilled water said organic bromine compounds split off less than one molar % of hydrogen bromide per equivalent of bromine present in the molecule.

4,228,245

FOAM RUBBER POLYBLEND

Albert W. Morgan, Collinsville, Ill., and Roland G. Ribaudo, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 934,759, Aug. 21, 1978, abandoned, which is a continuation-in-part of Ser. No. 873,760, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 592,306, Jul. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 454,490, Mar. 25, 1974, abandoned. This application Jul. 2, 1979, Ser. No. 53,871

Int. Cl.[2] C08J *9/04, 9/10*

U.S. Cl. 521—75 **30 Claims**

1. A foamed polyblend composition comprising a filled styrene-butadiene rubber blended with between about 10 and about 50 parts per hundred by weight, based on said rubber, of a vinyl chloride polymer plastisol which has been fused before being blended with said rubber, the weight ratio of said plastisol to the filler in said rubber being between about 0.09 and about 0.25.

4,228,246

MANUFACTURE OF FLUOROCARBON EXPANDED POLYSTYRENE

Bernard Taub, Williamsville; Daniel F. Harnish, Orchard Park, and Philip E. Jones, Snyder, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 26, 1975, Ser. No. 635,461

Int. Cl.[2] C08J *9/14*

U.S. Cl. 521—98 **6 Claims**

1. In the process for the preparation of polyolefin foams comprising blending a thermoplastic polyolefin with a nucleating agent and a volatile foaming agent, and extruding said composition into a region of lower pressure to cause foaming; the improvement which comprises employing as the volatile foaming agent, a mixture comprising from about 3 to about 70 weight percent monochloromonofluoromethane and from 97 to about 30 weight percent dichlorodifluoromethane.

4,228,247

STABILIZED POLYOXYALKYLENE POLYETHER POLYOL

Richard A. Moore, Trenton; Robert J. Hartman, Southgate; William W. Levis, Jr., Wyandotte, and Ralph E. Bloom, South Rockwood, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 29, 1979, Ser. No. 70,561

Int. Cl.[2] C08K *5/34, 5/52*

U.S. Cl. 521—107 **8 Claims**

1. A polyoxyalkylene polyether polyol containing an effective amount of a stabilizer composition containing

a. from about 20 to about 95 weight percent of a stabilizer selected from the group consisting of 2,6-di-t-butyl-4-methylphenol, 4,4'-bis(alpha,alpha-dimethylbenzyl)diphenylamine, p,p'-dioctyldiphenylamine, phenyldidecylphosphite, and mixtures therefrom, and

b. from about 5 to about 80 weight percent of 3,5-di-t-butyl-4-hydroxyhydrocinnamic acid triester of 1,3,5-tris(2-hydroxyethyl)-s-triazine-2,4,6(1H,3H,5H)-trione.

5. A polyurethane foam prepared by the reaction of an organic polyisocyanate with a polyoxyalkylene polyether polyol in the presence of a blowing agent, said polyol stabilized against oxidation with an effective amount of a stabilizer composition containing

a. from about 20 to about 95 weight percent of a stabilizer selected from the group consisting of 2,6-di-b-butyl-4-methylphenol, 4,4'-bis-t-(alpha,alpha-dimethylbenzene)diphenylamine, p,p'-dioctyldiphenylamine, phenyldidecylphosphite, and mixtures thereof, and

b. from about 5 to about 80 weight percent of 3,5-di-t-butyl-4-hydroxyhydrocinnamic acid triester of 1,3,5-tris(hydroxyethyl)-s-triazine-2,4,6(1H,3H,5H)-trione.

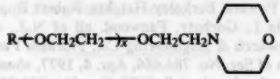
4,228,248

MORPHOLINE DERIVATIVES AND USE AS POLYURETHANE CATALYST

Robert L. Zimmerman, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,352
Int. Cl.[2] C08G *18/14, 18/20*
U.S. Cl. 521—115 **5 Claims**

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of an amine falling within the following structural formula:



where R is lower alkyl and X=0—4.

4,228,249

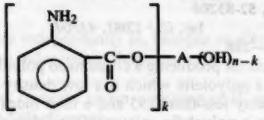
SEGMENTED POLYURETHANE RESINS

Johannes Blahak; Roland Gipp, both of Cologne; Kuno Wagner; Erwin Müller, both of Leverkusen; Jan Mazanek, Cologne, and Peter Haas, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Division of Ser. No. 875,646, Feb. 6, 1978. This application Apr. 2, 1979, Ser. No. 26,110
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706297; Oct. 4, 1977, 2744599
Int. Cl.[2] C08G *18/14*
U.S. Cl. 521—159 **5 Claims**

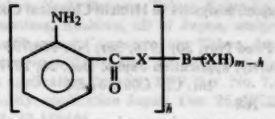
1. A process for said preparation of polyurethane resin, which may be cellular, comprising: reacting polyisocyanates, high molecular weight compounds having at least two isocyanate-reactive hydrogen atoms and a molecular weight of from about 500 to about 25,000 and, optionally, low molecular weight chain-lengthening agents, optionally in the presence of catalysts, blowing agents and other known additives wherein the higher molecular weight compounds having isocyanate-reactive hydrogen atoms used comprise: a mixture of

(a) from about 40 to about 85% by weight based on the total weight of (a)+(b), of compounds corresponding to the following general formula:



and

(b) from about 15 to about 60%, by weight, based on the total weight of (a) and (b), of compounds corresponding to the following general formula:



wherein

X represents oxygen or sulfur;

A represents a k-valent residue obtained by the removal of k hydroxyl groups from a polyol having n hydroxyl groups, an average molecular weight of from about 500 to about 5000 and a melting point higher than 130° C.;

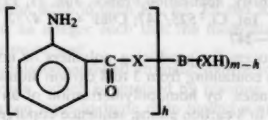
B represents an h-valent residue obtained by the removal of h hydroxyl groups and/or mercapto groups from a polyol or polythiol having m hydroxyl and/or mercapto groups, an average molecular weight of from about 500 to about 25,000 and a melting point below 60° C.;

k has an average value of from 0 to n;

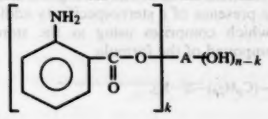
h has an average value of from 0 to m;

n represents 2 or 3; and

m represents an integer of from 2 to 8; characterized in that a prepolymer having isocyanate end groups is prepared in a first stage from said polyisocyanate and said compound of the formula:



and in a second stage, this prepolymer is reacted in the absence of a solvent with said compound of the formula:



and optionally low molecular weight chain-lengthening agents and another polyisocyanate.

4,228,250

BLENDS OF HYDROLYZED ETHYLENE-VINYL ACETATE RESINS HAVING INCREASED IMPACT STRENGTH

Ervin G. Pritchett, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jun. 28, 1979, Ser. No. 52,890
Int. Cl.[2] C08L *29/04*
U.S. Cl. 525—57 **9 Claims**

1. A resin blend demonstrating improved impact-resistance which comprises (a) as host resin, a hydrolyzed ethylene-vinyl acetate copolymer in which ethylene is present at from about 2 to about 60 weight percent, vinyl acetate is present at from about 0 to about 10 weight percent, and vinyl alcohol is present at about 98 to about 40 weight percent, blended with (b) an impact-resistance-increasing amount of an impact modifying resin which is a partially hydrolyzed ethylene-vinyl acetate copolymer in which ethylene is present at about 25 to about 70 weight percent, vinyl acetate is present at about 20 to about 70 weight percent and vinyl alcohol is present at about 0.5 to about 25 weight percent.

4,228,251

RESIN COMPOSITION HAVING LOW SHRINK PROPERTIES

Iwao Maekawa; Isao Uchigasaki, and Noboru Monma, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Nov. 30, 1978, Ser. No. 964,798
Claims priority, application Japan, Dec. 26, 1977, 52-156903
Int. Cl.[2] C08L 67/06
U.S. Cl. 525—168 15 Claims

1. A resin composition having low shrink properties which comprises

(A) 50 to 90 parts by weight of an unsaturated ester oligomer produced by carrying out condensation reaction of a glycol and hydroxylated dicyclopentadiene in an amount of 100 to 200% by mole per mole of the glycol with at least one unsaturated dibasic acid or anhydride thereof until an acid value of less than 40,

(B) 50 to 10 parts by weight of one or more polymerizable monomers having one or more polymerizable double bonds in the molecule, and

(C) 3 to 15 parts by weight of polystyrene based on 100 parts by weight of the total of the components (A) and (B).

4,228,252

PROCESS FOR MAKING ALPHA-OLEFIN POLYMERS OR COPOLYMERS WITH HIGH ISOTACTICITY INDEX

Gilbert Marie, Pau, France, assignor to Ato Chimie, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,171
Claims priority, application France, Jun. 21, 1978, 78 18530
Int. Cl.[2] 525/247; C08F 4/16, 4/52
U.S. Cl. 525—247 29 Claims

1. In a process for producing polymers or copolymers of alpha-olefins containing from 3 to 8 carbon atoms with a high isotacticity index, by homopolymerization of an alpha-olefin containing 3 to 8 carbon atoms, sequence copolymerization of such alpha-olefins with one another and/or with ethylene, or copolymerization of mixtures of such alpha-olefins with one another and/or with ethylene, such mixtures containing at least 85 moles percent of one such alpha-olefin, using a catalyst containing a titanium chloride and an organic aluminum compound, in the presence of a stereospecificity additive, the improvement which comprises using as the stereospecificity additive a compound of the formula:

$$R_1—O—(C_pH_{2p})—S—R_2,$$

where:

p is an integer from 1 to 6,

R_1 and R_2 are identical or different alkyl radicals containing 1 to 4 carbon atoms, or are linked together to form a divalent—(C_mH_{2m})—radical,

where: m is an integer from 1 to 6.

4,228,253

PROCESS FOR MAKING ALPHA-OLEFIN POLYMERS OR COPOLYMERS WITH HIGH ISOTACTICITY INDEX

Gilbert Marie, Pau, France, assignor to Ato Chimie, Paris, France

Filed Jun. 13, 1979, Ser. No. 48,172
Claims priority, application France, Jun. 21, 1978, 78 18531
Int. Cl.[2] C08F 4/16, 4/52
U.S. Cl. 525—247 35 Claims

1. A process for making polymers or coplymers of alpha-olefins containing 3 to 8 carbon atoms with a high isotacticity index, comprising polymerizing an alpha-olefin containing 3 to 8 carbon atoms, using a catalyst consisting of a titanium chloride together with an organic aluminum compound, in the presence of a stereospecificity additive, said stereospecificity additive being a cyclic polyether of the crown ether type, in which the molecule is made up of from 0 to 20 p groups of the formula $-X—C_nH_{2n}-$ and from 0 to 4 q groups of the formula $-X—R-$, with the number of p groups and q groups together being from 3 to 24, arranged in any order to form a cycle in which any two adjacent groups in the cycle are connected by a bond between the element X in one of these adjacent groups and a carbon atom in the other group, where n is an integer from 1 to 6, R, which is the same or different from one group to the other, represents divalent radicals selected from the group consisting of divalent radicals of aliphatic hydrocarbons containing 1 to 6 carbon atoms, divalent radicals of cycloaliphatic hydrocarbons containing 4 to 10 carbon atoms, divalent radicals of aromatic hydrocarbons containing 6 to 20 carbon atoms, and the divalent heterocyclic radicals of furane, thiophene and pyridine, in which both free valences are each borne by a carbon atom in the alpha position in relation to the heteroatom of these heterocycles, or by a carbon atom of an aliphatic hydrocarbon chain containing 1 to 6 carbon atoms fixed to the said carbon atom in the alpha position, and X is either identical in all the groups and represents oxygen atoms, or is different from one group to the other and represents partly oxygen atoms and partly sulphur atoms, nitrogen-containing radicals of the formula: $>N-R_1$, or both, where R_1 is a hydrogen atom or alkyl radical containing 1 to 4 carbon atoms, and the number of oxygen atoms r, sulphur atoms s and nitrogen-containing radicals t in the cyclic polyether molecule are such that $0 \leqq t \leqq r$, $0 \leqq s \leqq (r+t)$ and $1 \leqq r \leqq 28$.

4,228,254

FUNCTIONAL GROUP CONTAINING CYCLIC DIOLEFIN BUTYL RUBBERS

Kenneth W. Powers, Berkeley Heights; Robert Roper, Summit, and Martin L. Gorbaty, Fanwood, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 784,656, Apr. 4, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,327
Int. Cl.[2] C08F 8/46
U.S. Cl. 525—256 7 Claims

1. A tack-free, air dryable, self-curing elastomeric terpolymer coating having a viscosity average molecular weight of about 15,000 to 80,000 which consists essentially of about 85 to 95 mol % isobutylene, about 5 to 9 mol % C_5–C_{12} cyclic diolefin and about 0.5 to 5 mol % conjugated diolefin represented by the formula

$$CH_2=\underset{\displaystyle R}{\overset{\displaystyle R}{C}}—\underset{\displaystyle R}{\overset{\displaystyle R}{C}}=CRH$$

where each R is are independently hydrogen or acyclic or alicyclic hydrocarbon radicals having from 1 to 12 carbon atoms and wherein the terpolymer has attached thereto a functional group selected from the group consisting of anhydride, carboxy or hydroxy said coating being self-curing through surface oxidative crosslinking of said cyclic diolefin.

4,228,255

METHOD FOR PRODUCING CROSSLINKED POLYETHYLENES

Ikuo Fujimoto; Setsuya Isshiki; Yoshikazu Kurita, and Yoji Sato, all of Tokyo, Japan, assignors to The Fujikura Cable Works Ltd., Tokyo, Japan

Continuation of Ser. No. 859,693, Dec. 12, 1977, abandoned. This application Jun. 28, 1979, Ser. No. 53,108
Claims priority, application Japan, Dec. 14, 1976, 51-150190; Dec. 7, 1977, 52-83206
Int. Cl.[3] C08L 43/04
U.S. Cl. 525—288 9 Claims

1. A method for producing a crosslinked polyolefin comprising reacting a polyolefin which is a low density polyethylene having a density less than 0.93 and a melt index of 0.1 to 0.5 g/10 min. or a polyolefin mixture containing a low density polyethylene having a density less than 0.93 as major component, with a free radical generating compound and an organic

silane having the general formula $RR'SiY_2$, wherein R represents a monovalent olefinically unsaturated hydrocarbon or hydrocarbonoxy radical, each Y represents a hydrolyzable organic radical, and R' represents a monovalent hydrocarbon radical with the exception of aliphatically unsaturated hydrocarbon radicals, or a Y radical, to form a silane-grafted polyolefin, then mixing said silane-grafted polyolefin with a silanol condensation catalyst, and heating the mixture in the absence of water.

4,228,256

TRANSPARENT BLENDS OF RESINOUS COPOLYMERS AND GRAFTED ELASTOMERS

Joseph M. Schmitt, Ridgefield, Conn., assignor to CY/RO Industries, Stamford, Conn.

Filed Sep. 18, 1978, Ser. No. 943,604
Int. Cl.[2] C08L *9/00, 47/00*
U.S. Cl. 525—302 **8 Claims**

1. A method of preparing a non-agglomerating, readily dispersible grafted rubber comprising: (1) placing a rubber latex in a reaction vessel; (2) adding thereto one or more monomers to be grafted thereon; (3) equilibrating said rubber latex; (4) controllably adding to said equilibrated rubber latex and said monomers at least one monomer to be grafted thereon, wherein the addition of said monomer takes at least 15 minutes and is in the substantial absence of added emulsifier; during which time a grafting reaction occurs.

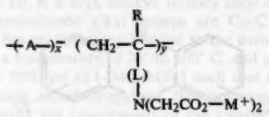
4,228,257

POLYMERS FOR USE IN IMAGE RECEIVING ELEMENTS FOR METALLIZABLE DYES IN IMAGE TRANSFER FILM UNITS

Gerald A. Campbell; Lewis R. Hamilton, and David P. Brust, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

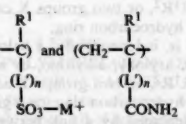
Division of Ser. No. 971,620, Dec. 20, 1978. This application Jun. 6, 1979, Ser. No. 46,138
Int. Cl.[2] C08F *8/44*
U.S. Cl. 525—328 **10 Claims**

1. A polymer comprising units having the formula:



wherein:

(A) is a unit selected from the group consisting of:



R and R^1 are independently H, halogen or alkyl;

L and L' are independent linking groups;

n is 0 or 1;

M is selected from the group consisting of H, an ammonium cation and alkali metal;

x is from 20 to 95 weight percent; and

y is from 80 to 5 weight percent.

4,228,258

RESIN COMPOSITION CONTAINING POLYPHENYLENE OXIDE

Akitoshi Sugio, Omiya; Masanobu Masu, Tokyo; Masaharu Kimura, Tokyo; Norio Sayama, Tokyo; Keiun Ko, Minoo, and Eiichi Yonemitsu, Kashiwa, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 640,776, Dec. 15, 1975, Pat. No. 4,153,644. This application Jan. 29, 1979, Ser. No. 7,572
Claims priority, application Japan, Dec. 26, 1974, 49-148445; Dec. 26, 1974, 49-148446
Int. Cl.[3] C08L *71/04*
U.S. Cl. 525—390 **7 Claims**

1. A resin composition containing a polyphenylene oxide, comprising

(A) a polyphenylene oxide having the following formula and having a molecular weight of 10,000 or higher:

wherein R_1 and R_2 are lower, straight chain alkyl groups of 1–4 carbon atoms; each of R_3 and R_4 is a hydrogen atom or has the same meaning as defined above for R_1 and R_2; the α-carbon atom in each R_1, R_2, R_3 and R_4 is not tertiary; n is an integer such that the molecular weight is 10,000 or more; and

(B) a thermoplastic modified aromatic hydrocarbon formaldehyde resin, which is obtained by reacting an aromatic hydrocarbon formaldehyde resin having a number average molecular weight of 500 or higher with at least one member selected from the group consisting of phenol, p-tert-butylphenol, p-octylphenol and p-nonylphenol in the presence of an acid catalyst, the weight ratio of said resin (A) to said resin (B) being from 10:90 to 99:1.

4,228,259

WATER-SOLUBLE CATIONIC POLYMER DYE COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Gregoire Kalopissis, Neuilly; Alexandre Zysmann; Henri Sebag, both of Paris; Guy Vanlerberghe, Commune de Villenaude; Jean-Louis Huron, Mulhouse, and Andree Bugaut, Boulogne, all of France, assignors to L'Oreal, Paris, France

Filed Aug. 8, 1977, Ser. No. 822,912
Claims priority, application France, Aug. 12, 1976, 76 24618
Int. Cl.[2] C08G *69/48*
U.S. Cl. 525—435 **5 Claims**

1. A water-soluble polymer dye which is the reaction product of

(1) as a water-soluble cationic polymer a polyamino amide, with

(2) as a chromophore or chromogen group carrying compound, an aromatic amine, said aromatic amine being linked to said polyamino amide by a tertiary amine group, the main chain of said polymer dye having at least 10% aliphatic amine groups relative to the total number of amine groups in said main chain.

4,228,260

SUPPORTED CHROMIUM-OXIDE POLYMERIZATION CATALYST HAVING A POROUS SILICA SUPPORT USED IN THE POLYMERIZATION OF OLEFINES

Joseph J. F. Scholten, Sittard, and Lambertus J. M. A. van de Leemput, Echt, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Division of Ser. No. 924,746, Jul. 14, 1978. This application Apr. 23, 1979, Ser. No. 32,223

Claims priority, application Netherlands, Jul. 18, 1977, 7707961

Int. Cl.[2] C08F 4/02, 4/24

U.S. Cl. 526—106 2 Claims

1. In a process for polymerizing olefines, the improvement consisting of using as the polymerization catalyst, a supported chromium-oxide catalyst having as the support a porous, pure silica with a sodium content of at most about 200 ppm and a pore volume of at least about 1.0 cm^3/g prepared by the process comprising the steps of

(a) admixing to a non-porous silica prepared by the flame hydrolysis of a silica-halogen compound at least about 50% by weight of water per weight of water plus silica,

(b) forming a silica gel from said admixture of non-porous silica and water,

(c) spray drying said silica gel to form a catalyst support,

(d) placing a chromium compound on said support, and

(e) heating the supported chromium compound in a non-reducing atmosphere to form a supported chromium compound.

4,228,261

SUPPORTED CHROMIUM-OXIDE POLYMERIZATION CATALYST HAVING A POROUS SILICA SUPPORT USED IN THE POLYMERIZATION OF OLEFINES

Joseph J. F. Scholten, Sittard, and Lambertus J. M. A. van de Leemput, Echt, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Division of Ser. No. 924,742, Jul. 14, 1978. This application Apr. 23, 1979, Ser. No. 32,638

Claims priority, application Netherlands, Jul. 18, 1977, 7707960

Int. Cl.[2] C08F 4/02, 4/24

U.S. Cl. 526—106 2 Claims

1. In a process for polymerizing olefines, the improvement consisting of using as the polymerization catalyst, a supported chromium-oxide catalyst having as the support a porous, pure silica with a pore volume of at least about 1.0 cm^3/gram and a sodium content of at most about 200 ppm prepared by the process comprising the steps of

(a) admixing to a non-porous silica prepared by the flame hydrolysis of a silicon-halogen compound at least about 50% by weight of water per weight of water plus silica,

(b) forming a silica gel from said admixture of non-porous silica and water,

(c) heating said gel at a temperature between about 200° C. to about 1000° C. to dry the gel,

(d) grinding the dried silica to a particle size of at least about 10 microns to form a catalyst support,

(e) placing a chromium compound on said support, and

(f) heating the supported chromium compound in a non-reducing atmosphere to form a supported chromium-oxide catalyst.

4,228,262

PROCESS FOR THE PRODUCTION OF POLYMER OR COPOLYMER OF AN OLEFIN MONOMER

Anthony D. Caunt, Welwyn Garden City, and Ian G. Williams, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 849,357, Nov. 7, 1977, Pat. No. 4,161,461. This application Apr. 13, 1979, Ser. No. 29,881

Claims priority, application United Kingdom, Nov. 15, 1976, 47449/76

Int. Cl.[2] C08F 4/64

U.S. Cl. 526—119 15 Claims

1. In a process for the production of a polymer or copolymer of an olefine monomer wherein at least one olefine monomer, or a mixture of at least one olefine monomer and ethylene, is contacted, under polymerization conditions, with an olefine polymerization catalyst comprising:

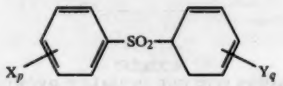
(1) a solid compound of a transition metal which is the product obtained by grinding a solid halide of a transition metal of Groups IVA to VIA of the Periodic Table in the presence of a Lewis

Acid and at least one organic sulphur-containing compound of one of the formulae (A), (B) or C, and washing the ground product with a liquid medium; and

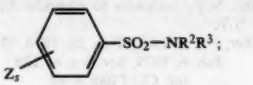
(2) at least one organo-metallic compound of aluminum, or of a non-transition metal of Group IIA of the Periodic Table, or a complex of an organo-metallic compound of a non-transition metal of Group IA or IIA of the Periodic Table and an organo-aluminum compound,

wherein

formula (A) is

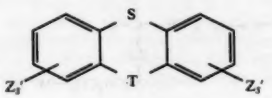


formula (B) is



and

formula (C) is



where

X, or each X, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^1R^2$, or two groups X can together form an unsaturated hydrocarbon ring;

Y, or each Y, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^1R^2$, or two groups Y can together form an unsaturated hydrocarbon ring; or a group X and a group Y may be replaced by a link between the two phenyl groups attached to the $—SO_2—$ group, the linkage being either direct or through a group —O—, $—CH_2—$, $—NR^1—$, —S—, or —CO—;

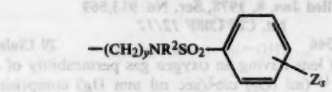
R^1 is a hydrogen atom or a hydrocarbyl group;

R^2 is a hydrocarbyl group;

p and q are each, independently, an integer from 0 up to 5;

Z, or each Z, is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a

group $—NR^1R^2$, or two groups Z can together form an unsaturated hydrocarbon ring;
R^3 is a hydrocarbyl group or a group



s is an integer from 0 up to 5;
y is a positive integer;
T is —S—, —O—, $—NR^2—$, or —CO—; and
Z', or each Z', is, independently, a halogen atom, an alkyl, aryl, alkoxy, aryloxy, alkylthio, or arylthio group, or a group $—NR^1R^2$; the improvement which comprises using as component (1) of the catalyst, the product obtained by adding up to 2.50 moles of aluminum chloride to the solid halide of the transition metal for each gram atom of the transition metal which is present in the solid halide of the transition metal, grinding the mixture of aluminum chloride and the solid halide of the transition metal, adding to the ground mixture from 0.01 up to 0.50 moles of titanium tetrachloride, and from 0.10 up to 2.50 moles of the organic-sulphur-containing compound, for each gram atom of the transition metal which is present in the solid halide of the transition metal, grinding the mixture thereby obtained and washing the ground product with a liquid medium capable of dissolving the at least one organic sulphur-containing compound and at least one of aluminum chloride or titanium tetrachloride or a complex of the at least one organic sulphur-containing compound and at least one of aluminum chloride or titanium tetrachloride.

4,228,263
POLYMERIZATION OF PROPYLENE WITH A CATALYST PREPARED IN SITU

Edward G. Howard, Jr., Hockessin, and Christos Sarafidis, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 20, 1978, Ser. No. 917,281
Int. Cl.[2] C08F *4/02, 10/06*
U.S. Cl. 526—154 **10 Claims**

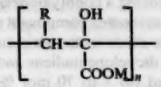
1. In the method of producing elastomeric polymers of propylene and up to about 5 mole % of another α-olefin by the polymerization of propylene in the presence of a catalyst system which is the reaction product of a metal oxide and an organometallic compound of the formula $(RCH_2)_4M$, where M is Zr, Ti or Hf; R is aryl, aralkyl, tertiary alkyl or trialkylsilyl; the aforementioned alkyl groups are C_1–C_{12}; and the RCH_2 group has no hydrogen bonded to the carbon which is beta to M; at a temperature of 20° to 100° C. and a pressure of 147 psi up to 5000 psi (0.1–34.5 MPa) such that the reaction medium contains liquid propylene, the improvement which comprises mixing the components of the catalyst system together, whereby they react to form said catalyst system, in a solvent consisting principally of liquid propylene and the elastomeric polymer is produced as a mobile slurry in said liquid propylene.

4,228,264
SUSPENSION POLYMERIZATION OF VINYL CHLORIDE USING HYDROXYACRYLIC POLYMERS

Akira Yamamoto; Masaru Iida; Satoru Miyake; Hideo Yamaura, and Takeshi Inoue, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Limited, Tokyo, Japan

Continuation of Ser. No. 732,537, Oct. 14, 1976, abandoned.
This application Mar. 27, 1978, Ser. No. 890,488
Claims priority, application Japan, Oct. 28, 1975, 50-129745
Int. Cl.[2] C08F *2/20, 14/06*
U.S. Cl. 526—200 **6 Claims**

1. A method of suspension polymerization of vinyl chloride or vinyl chloride with a comonomer, which comprises: polymerizing said vinyl chloride or vinyl chloride with a comonomer in an aqueous medium in the presence of a combination of a polymerization improver having units of the formula:



(I)

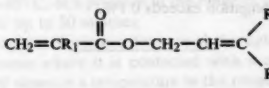
wherein
M represents an alkali metal;
R represents hydrogen, methyl, ethyl, propyl or butyl and
n represents an integer of 10 to 1500, and a suspending agent selected from the group consisting of methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, hydroxypropylmethyl cellulose, carboxymethyl cellulose, polyvinyl alcohol, partially hydrolyzed polyvinyl acetate, styrene-maleic anhydride copolymer, vinyl acetate-maleic anhydride copolymer, partially hydrolyzed polyacrylic acid ester, polymethacrylic acid ester, gelatin, and starch, the amount of said polymerization improver ranging from 0.00005 to 0.1 parts by wt. per 100 parts by wt. of total monomer and from 0.05 to 100 parts by wt. per 100 parts by wt of the suspending agent.

4,228,265
PROCESS FOR PRODUCING SULFUR-CURABLE ACRYLIC RUBBERS

Tetsu Ohishi, Tokyo; Kohichi Handa, Kamakura, and Haruo Ueno, Tokyo, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Mar. 27, 1979, Ser. No. 24,476
Int. Cl.[2] C08F *220/40*
U.S. Cl. 526—230 **10 Claims**

1. A process for producing a sulfur-curable acrylic rubber, which comprises copolymerizing in the presence of a radical initiator
(1) 90 to 99.5% by weight of at least one alkyl acrylate with the alkyl group containing 1 to 8 carbon atoms, and
(2) 0.5 to 10% by weight of at least one monomer of the general formula



wherein R_1 represents a hydrogen atom or a methyl group, and R_2 and R_3, independently from each other, represent an alkyl group containing 1 to 3 carbon atoms.

4,228,266
PROCESS FOR PRODUCING COPOLYMERIZED RESINS

Ken-ichi Kudo; Yoshihiko Kitagawa; Teruhisa Koyama, all of Niihama; Akira Takata, Habikino; Shuichi Kanagawa, Osaka, and Tetsuo Yamaguchi, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 799,266, May 23, 1977, Pat. No. 4,129,557.
This application Aug. 21, 1978, Ser. No. 935,609
Claims priority, application Japan, May 26, 1976, 51/61614; May 26, 1976, 51/61615; Jul. 30, 1976, 51/91490; Jul. 30, 1976, 51/91491
Int. Cl.[2] C08F *236/00, 36/00, 232/08*
U.S. Cl. 526—283 **10 Claims**

1. A thermally copolymerized resin having a softening point of 50° to 200° C., a number average molecular weight of 300 to 1,500 measured by vapor pressure osmometry and a bromine number of less than 120 and soluble in hydrocarbon solvents, the composition of said resin comprising (a) 30 to 97 mol % of

one or more monomeric substances selected from cyclopentadiene, dicyclopentadiene and alkyl-substituted compounds thereof, and (b) 3 to 70 mol % of one or more hydroxystyrene derivatives.

4. A method of producing a copolymerized resin, characterized in that a starting monomer component comprising (a) 30 to 97 mol % of one or more monomeric substances selected from cyclopentadiene, dicyclopentadiene and alkyl-substituted compounds thereof and (b) 3 to 70 mol % of one or more hydroxystyrene derivatives is copolymerized thermally at a temperature of 240° to 300° C. without using any catalyst.

4,228,267

METHYL METHACRYLATE-BASED RESIN FILM AND SHEET

Ryuichi Higashizume, and Masahiko Iyoku, both of Suzuka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Sep. 4, 1979, Ser. No. 72,170

Claims priority, application Japan, Sep. 9, 1978, 53-110228; Dec. 13, 1978, 53-153173; May 8, 1979, 54-055240

Int. Cl.[2] C08F *220/14*

U.S. Cl. 526—328.5 7 Claims

1. A methyl methacrylate-based resin film and sheet containing as comonomer 1 to 15% by weight of an alkyl acrylate whose alkyl group has one to four carbon atoms and 0 to 3% by weight of an ultraviolet ray absorbent, which film and sheet possess a specific supra-molecular structure such that the melt flow rate (as measured under Conditions I defined by ASTM, D1238-70) falls in the range of from 0.5 to 12 g/10 min., the orientation release stress falls in the range of 5 to 30 kg/cm^2 (based on the method of ASTM D1504), the ratio of the orientation release stresses in the two axial directions (the ratio of the orientation release stress in the direction of its maximum value vs. the orientation release stress in the direction of its minimum value) falls in the range of from 1 to 2, the difference of the orientation release stresses in the two axial directions (the difference of the orientation release stress in the direction of its maximum value subtracted by the orientation release stress in the direction of its minimum value) falls below 10 kg/cm^2, the high-speed tensile strength exceeds 7 kg/mm^2 and the critical elongation exceeds 0.1%.

4,228,268

PROCESS FOR POLYMERIZING HOMOGENIZED VINYL CHLORIDE EMULSION WHICH HAD BEEN PRE-DISPERSED

Takanori Musha, and Yao Terutaka, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,731

Claims priority, application Japan, May 23, 1978, 53-61392

Int. Cl.[2] C08F *14/06*

U.S. Cl. 526—344.2 10 Claims

1. A process for polymerizing vinyl chloride, which comprises mixing in an agitation tank vinyl chloride monomer or a monomeric mixture composed of a major proportion of vinyl chloride and a minor proportion of a monomer copolymerizable therewith, with water, an emulsifier, a polymerization initiator soluble in the vinyl monomer and polymerization aids for each batch to form a preliminary dispersion in which liquid droplets of the vinyl chloride monomer have a weight average particle diameter of 5 to 40 microns, wherein the proportion of liquid droplets having a particle diameter of at least 50 microns is 0 to 10% by weight, based on the entire liquid droplets, applying a homogenizing technique to the preliminary dispersion to form a homogenized emulsion, and feeding the emulsion to a polymerization step and polymerizing said emulsion.

4,228,269

CONTACT LENSES OF HIGH GAS PERMEABILITY

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen Inc., Chicago, Ill.

Filed Jun. 8, 1978, Ser. No. 913,569

Int. Cl.[3] C08F *12/12*

U.S. Cl. 526—346 29 Claims

1. A contact lens having an oxygen gas permeability of at least 1.5×10^{-11} (ml (O_2) cm^2/sec ml mm Hg) comprising homopolymers and interpolymers formed by the polymerization of monomers comprising at least one alkyl styrene monomer having at least one C_2 or higher alkyl on the aromatic ring.

4,228,270

POLYBORODIPHENYLSILOXANES

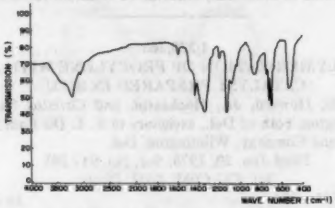
Hiroshi Kobayashi, Fuji, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1978, Ser. No. 969,006

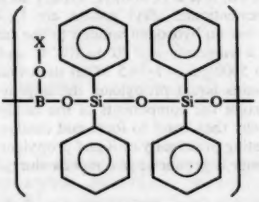
Claims priority, application Japan, Dec. 14, 1977, 52-149395; Dec. 20, 1977, 52-152439

Int. Cl.[2] C08G *79/08*

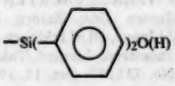
U.S. Cl. 528—8 7 Claims



1. A polyborodiphenylsiloxane having main repeating units of the formula,

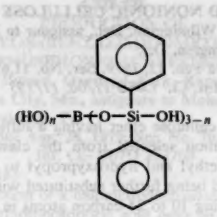


wherein X is a hydrogen atom or



and a weight-average molecular weight of about 800 to about 5,000.

3. A method of preparing the polyborodiphenylsiloxane of claim 1, which comprises polycondensing a borodiphenylsiloxanol of the formula,



wherein n is zero or one, at a temperature of from about 140° C. to about 400° C. in the absence of a solvent.

4,228,271

PROCESS FOR PREPARING EPOXY RESIN

Nikolai S. Enikolopov, Kutuzovsky prospekt, 26, kv. 245; Anatoly I. Nepomnyaschy, ulitsa Scherbakovskaya, 5, kv. 52, both of Moscow; Viktor A. Pekarsky, ulitsa Kirova, kvartal 116, 24, kv. 30, Ljubertsy Moskovskoi oblasti; Tatyana A. Pekarskaya, Bratskaya ulitsa, 8, kv. 60, Moscow; Mikhail G. Brusilovsky, Krymsky val, 8, kv. 56, Moscow; Svetlana A. Gavrilina, Frunzenskaya naberezhnaya, 26, kv. 5, Moscow; Naum D. Lerman, ulitsa Volgogradskaya, 43a, kv. 40, Yaroslavl; Oleg K. Maimur, Zhivopisnaya ulitsa, 17, korpus 2, kv. 188, Moscow; Arkady L. Iljushin, ulitsa 9 Pyatiletki, 9, kv. 79, Kotovsk Tambovskoi oblasti; Mikhail A. Markevich, prospekt Vernadskogo, 89, korpus 4, kv. 12, Moscow; Susanna M. Karpacheva, ulitsa Marshala Novikova, 2, kv. 88, Moscow; Lidia P. Khorkhorina, 2 Peschany pereulok, 20, korpus 1, kv. 54, Moscow; Valeryan M. Muratov, Ostakhovsky pereulok, 1/2, kv. 118, Moscow, and Semen F. Sholk, Zvenigorodskoe shosse, 3a, kv. 223, Moscow, all of U.S.S.R.

Filed Mar. 12, 1979, Ser. No. 19,446
Int. Cl.[2] C08G 59/06
U.S. Cl. 528—95 6 Claims

1. A process for preparing epoxy resin, comprising allowing a mixture of epichlorohydrin, 2,2-bis(p-hydroxyphenyl) propane and a solvent in the presence of an alkali used in an amount of from 0.5 to 4% by weight of the epichlorohydrin, to stay at a temperature of from 45° to 70° C. to obtain a homogeneous mass with subsequent adding to the resultant mass of an alkali used in an amount of from 45 to 50% by weight of the epichlorohydrin and conducting polycondensation at a temperature of from 70° to 90° under stirring to obtain the end product.

4,228,272

METHOD OF CATALYTICALLY PREPARING TETRAHYDROFURAN/ALKYLENE OXIDE POLYMERIZATES USING A MONTMORILLONITE CLAY AS THE CATALYST

Thomas W. Del Pesco, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 923,570, Jul. 11, 1978, abandoned. This application Mar. 27, 1979, Ser. No. 24,385
Int. Cl.[2] C08G 65/20
U.S. Cl. 528—413 3 Claims

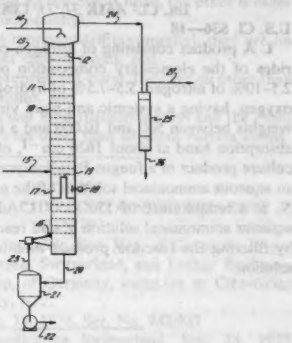
1. In a process for catalytically preparing a tetrahydrofuran-/alkylene oxide polymerizate, the improvement comprising using as the catalyst an acid-activated montmorillonite clay having a pore volume of 0.4–0.8 cubic centimeter per gram, a surface area of 220–260 square meters per gram, and an average pore diameter of 0.1–0.3 micron.

4,228,273

PROCESS FOR THE REMOVAL OF VINYL CHLORIDE FROM AQUEOUS DISPERSIONS OF VINYL CHLORIDE RESINS

William G. Hughes, Plainfield, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Sep. 5, 1978, Ser. No. 939,769
Int. Cl.[3] C08F 6/24, 6/16
U.S. Cl. 528—491 5 Claims



1. The process for the removal of vinyl chloride from an aqueous dispersion that contains 5%–50% by weight of a vinyl chloride resin and 1000 ppm–15,000 ppm of vinyl chloride that comprises the steps of

(a) feeding the aqueous dispersion into a first treatment zone having a series of surfaces each having therein perforations through which the dispersion can flow downward onto the next surface in the series;

(b) contacting the aqueous dispersion in the first treatment zone with a countercurrent stream of steam and vinyl acetate at a temperature in the range of 65°–85° C. at a pressure in the range of 200 torr to 600 torr to strip at least 90% of the vinyl chloride from the dispersion;

(c) passing the dispersion downward into a second treatment zone where it is maintained at a temperature in the range of 75°–85° C. at a pressure in the range of 200 torr to 400 torr for up to 30 minutes;

(d) passing the dispersion downward through a third treatment zone where it is contacted with a countercurrent flow of steam at a temperature in the range of 75°–95° C. at a pressure in the range of 300 torr to 600 torr; and

(e) recovering an aqueous dispersion that contains less than 10 ppm of vinyl chloride.

4,228,274

1-SUBSTITUTED GLYCOPYRANOSIDES

Mitree M. Ponpipom, North Plainfield; Robert L. Bugianesi, Colonia; Philippe L. Durette, New Providence; Howard M. Katzen, North Plainfield, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 898,265, Apr. 20, 1978, abandoned, which is a continuation of Ser. No. 727,551, Sep. 28, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 922,897
Int. Cl.[2] C07H 5/06, 5/08
U.S. Cl. 536—4 5 Claims

1. A hypoglycemic compound selected from the group consisting of 1-[(ω-aminoalkyl)thio]-1-deoxy-glycopyranosides and 1-[(ω-aminoalkanoyl)amino]-1-deoxy-glycopyranosides, wherein said alkyl contains 2 to 8 carbon atoms and said alkanoyl contains 3 to 9 carbon atoms.

4,228,275

NITROGEN CONTAINING POLYSACCHARIDE AND PROCESS FOR PREPARING SAME

Kiro Asano, Kukizaki; Tsuyoshi Saito, Tokyo; Masayoshi Hatanaka, and Susumu Ikeda, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1978, Ser. No. 943,474
Claims priority, application Japan, Sep. 16, 1977, 52/111968
Int. Cl.[2] A61K *31/73;* C08B *37/00*
U.S. Cl. 536—18 6 Claims

1. A product consisting of nitrogen-containing polysaccharides of the elementary composition of 38–50% of carbon, 2.5–10% of nitrogen, 5.5–7.5% of hydrogen and the balance of oxygen, having a systemic anti-plant viral activity, molecular weights between 500 and 10,000 and a characteristic infrared absorption band at about 1620 cm^{-1}, obtained by bringing a culture product of a fungus Basidiomycetes into reaction with an aqueous ammoniacal solution of the normality of 0.03 to 17 N, at a temperature of 150°–250° C. under pressure of said aqueous ammoniacal solution at said reaction temperature and by filtering the reaction product then by drying the filtered solution.

4,228,276

DIRECT PRECIPITATION METHOD FOR PRODUCING EXTRUSION-GRADE CELLULOSE ACETATE POWDER AND RESULTING PRODUCT

Chung-Ming Kuo, and Richard T. Bogan, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1979, Ser. No. 24,281
Int. Cl.[3] C08B *3/06, 3/22*
U.S. Cl. 536—76 16 Claims

1. Method for preparing cellulose acetate powder from an acid dope containing from about 6% to about 15% by weight cellulose acetate ester, the acid dope comprising about 60 to about 100 percent aqueous acetic acid solution and a cellulose acetate ester dissolved in the solution and having an acetyl content of about 38 to about 41 weight percent; the method comprising:

(a) mixing in the dope about 0.25 to about 5.0 parts per part of cellulose acetate ester of a water immiscible coagulating agent having a boiling point less than 150° C. (302° F.) to form a mixture;

(b) precipitating from the mixture the cellulose acetate ester in about 25% to about 35% aqueous acid at a temperature of about 65° C. (149° F.) to about 95° C. (203° F.) by adding at a rate slow enough to prevent localized precipitation about 5% to about 12% aqueous acetic acid solution that is preheated to the same temperature as the acid dope while vigorously agitating the mixture sufficiently to keep large coagulate particles apart into smaller coagulate particles of a size that will pass through a 45 mesh screen so as to form a liquid powder slurry;

(c) aging the liquid powder slurry for about 15 minutes in about 25% to about 35% aqueous acetic acid;

(d) removing the coagulating agent from the liquid powder slurry down to about 1% or less by weight of the liquid powder slurry and at a temperature of about 65° C. to about 95° C.;

(e) removing liquid from the liquid powder slurry remaining after step (d) to obtain a wet powder of coagulate particles;

(f) washing the wet powder with water to remove the residual acetic acid; and drying the powder at a temperature of about 65° C. to about 95° C. to remove the water.

4,228,277

MODIFIED NONIONIC CELLULOSE ETHERS

Leo M. Landoll, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Feb. 12, 1979, Ser. No. 11,613
Int. Cl.[3] C08B *11/08, 11/193*
U.S. Cl. 536—90 6 Claims

1. A nonionic cellulose ether having a sufficient degree of nonionic substitution selected from the class consisting of methyl, hydroxyethyl and hydroxypropyl to cause it to be water-soluble and being further substituted with a long chain alkyl radical having 10 to 24 carbon atoms in an amount between about 0.2 weight percent and the amount which renders said cellulose ether less than 1% by weight soluble in water.

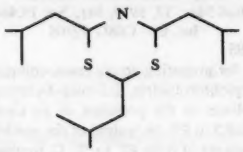
4,228,278

PREPARATION OF 2,4,6-TRI-ISOBUTYL DIHYDRO-1,3,5-DITHIAZINE

Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 10,887, Feb. 9, 1979, which is a continuation-in-part of Ser. No. 961,684, Nov. 17, 1978. This application Sep. 13, 1979, Ser. No. 75,078
Int. Cl.[3] C07D *285/00*
U.S. Cl. 544—5 1 Claim

1. A process for producing crystalline 2,4,6,-tri-isobutyl-dihydro-1,3,5-dithiazine having the structure:



comprising the steps of:

(i) reacting isovaleraldehyde with ammonium sulfide in the presence of citric acid in aqueous media a temperature of between 0° C. and 15° C. with the mole ratio of ammonium sulfide:isovaleraldehyde being between 2:1 and 1:0.5; the reaction time being between one and five hours thereby forming a gel;

(ii) converting the resulting reaction mass gel to a two-liquid phase system; an organic phase and an aqueous phase by means of mechanical agitation of said gel;

(iii) separating the aqueous phase from the organic phase;

(iv) admixing the organic phase with aqueous mineral acid whereupon a crystalline precipitate is formed;

(v) separating the resulting crystals from the resulting mixture;

(vi) washing the resulting crystals with a non-dissolving hydrocarbon liquid;

(vii) neutralizing the resulting washed crystals by dissolving said crystals in a solvent and admixing the resulting solution with a weak base;

(viii) washing out the excess base from the resulting solution and drying the resulting organic solution;

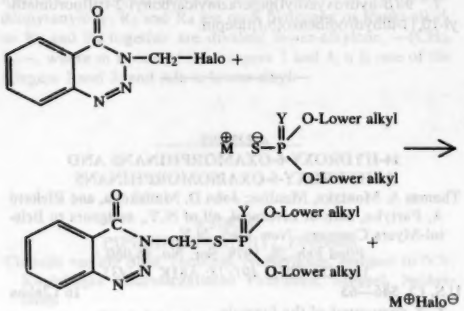
(ix) evaporating the solvent from said organic solution to yield 2,4,6-tri-isobutyl-dihydro-1,3,5-dithiazine in crystalline form.

4,228,279
PRODUCTION OF O,O-DIALKYL-S-(BENZAZIMIDOMETHYL)-THIOLPHOSPHORIC ACID ESTERS

Vidyanatha A. Prasad, Overland Park, Kans., and James H. Vines, Kansas City, Mo., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 28, 1979, Ser. No. 70,478
Int. Cl.[2] C07D 253/08
U.S. Cl. 544—183 **6 Claims**

1. In the reaction of a halomethylbenzazamide with an 0,0-di-lower alkyl-thiolphosphoric acid ester to form an ester in accordance with the equation



in which

Y is oxygen or sulfur, and

M is an alkali metal or ammonium cation,

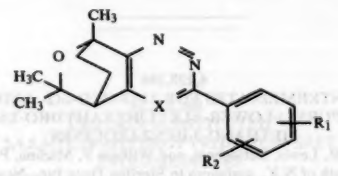
the improvement which comprises starting the reaction at a pH from about 2.5 to 5.5, whereby the desired reaction product is produced in higher yield and assay.

4,228,280
PYRANO[4,3-e]-AS-TRIAZINES AND CORRESPONDING 4-OXIDES

Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 874,940, Feb. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 779,071, Mar. 18, 1977, abandoned. This application May 16, 1979, Ser. No. 39,659
Int. Cl.[2] C07D 491/08
U.S. Cl. 544—184 **26 Claims**

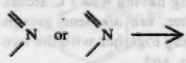
1. A compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and

X represents



provided that

(i) when one of R_1 and R_2 represents nitro, the other is other than nitro or trifluoromethyl;

(ii) when R_1 and R_2 represent trifluoromethyl, they are on other than adjacent carbon atoms; and

(iii) when R_1 and R_2 represent t-butyl, they are on other than adjacent carbon atoms, and

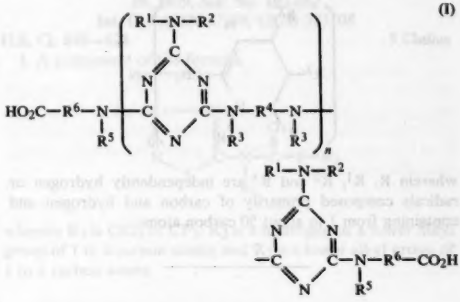
(iv) when one of R_1 and R_2 is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms.

4,228,281
DICARBOXYLIC ACIDS CONTAINING TRIAZINE RINGS

Thomas Kainmüller, Lindenfels, Fed. Rep. of Germany; Jürgen Habermeier, Pfeffingen, Switzerland, and Lothar Buxbaum, Lindenfels, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,031
Claims priority, application Switzerland, Sep. 23, 1977, 11651/77
Int. Cl.[2] C07D 403/12
U.S. Cl. 544—198 **15 Claims**

1. A compound of the formula



(I)

in which

n has a value from 1 to 100,

R^1, R^2, R^3 and R^5 independently of one another are each a hydrogen atom, a straight- or branched-chain alkyl of 1 to 22 C atoms, cycloalkyl of 5 to 7 C atoms, cyclohexylmethyl, aryl of 6 to 10 C atoms, benzyl, or said cycloalkyl, said cyclohexylmethyl, said aryl or said benzyl substituted with alkyl of 1 to 4 C atoms, or

R^1 and R^2 together are alkylene of 3 to 7 C atoms, 3-oxapentylene or 3-thiapentylene,

R^4 is a straight- or branched-chain alkylene of 2 to 18 C atoms, cycloalkylene of 5 to 7 C atoms, arylene of 6 to 10 C atoms, cycloalkylenealkylene or cycloalkylenebisalkylene with 1 to 4 C atoms in the alkylene group, arylenealkylene or arylenebisalkylene with 1 to 4 C atoms in the alkylene group; or said cycloalkylene, said cycloalkylenealkylene or said cycloalkylenebisalkylene substituted with alkyl of 1 to 4 C atoms, or said arylene, said arylenealkylene or said arylenebisalkylene substituted by alkyl of 1 to 6 C atoms or by halogen, or

R^4 is phenylene-X-phenylene where X is a direct bond, O, S, SO_2, alkylene of 1 to 3 C atoms, alkylidene of 2 to 12 C atoms, cycloalkylidene of 5 to 6 C atoms, benzylidene, bisphenylmethylidene, 1,1,1-trichloroethylidene or -O-p-phenylene-O—, or

R^4 together with one R^3 and the N atom to which they are bound form a ring having 4 to 7 C atoms, or R^4, and also both R^3s together, are alkylene groups having 1 to 5 atoms, and forming together with the two N atoms a 5- to 7-membered ring, and

R^6 is a straight- or branched-chain alkylene or alkylidene of 1 to 12 C atoms, o-phenylene, m-phenylene, p-phenylene, p-benzylene or p-cyclohexylene or

the corresponding acid halides, or the corresponding esters where the ester moiety is alkyl or hydroxyalkyl of 1 to 12 C atoms, cycloalkyl or hydroxycycloalkyl of 5 to 6 ring carbon atoms or aryl of 6 to 10 C atoms.

4,228,282

LUBRICATING OIL ADDITIVE

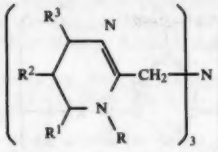
Bruce W. Hotten, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 920,436, Jun. 29, 1978, which is a division of Ser. No. 845,700, Oct. 26, 1977, Pat. No. 4,157,972, which is a continuation-in-part of Ser. No. 610,761, Sep. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 431,831, Jan. 7, 1974, abandoned. This application Dec. 28, 1978, Ser. No. 974,199

Int. Cl.² C07D *403/14*

U.S. Cl. 544—296 **4 Claims**

1. A compound of the formula



wherein R, R^1, R^2 and R^3 are independently hydrogen or radicals composed primarily of carbon and hydrogen and containing from 1 to about 50 carbon atoms.

4,228,283

PROCESS FOR PREPARING PURE 2-METHYL-3-(β-HYDROXYETHYLCARBAMOYL)-QUINOXALINE 1,4-DI-N-OXIDE, AND OTHER COMPOUNDS SIMILAR THERETO

Vincenzo Giobbio, Loranze' di Ivrea, Italy, assignor to Marxer S.p.A., Loranze', Italy

Filed Mar. 8, 1979, Ser. No. 18,516

Claims priority, application Italy, Nov. 24, 1978, 69686 A/78

Int. Cl.² C07D *241/44*

U.S. Cl. 544—355 **11 Claims**

1. A process for preparing high purity 2-methyl-3-(β-hydroxyethyl-carbamoyl) quinoxaline 1,4-di-N-oxide, comprising the following stages carried out separately and in succession:

(a) reacting benzofuroxane with an acetacetic acid ester of formula $CH_3—CO—CH_2—COOR$ in which R is a C_1–C_6 alkyl radical, in the presence of a catalyst in the form of ethanolamine, and in a suitable solvent;

(b) separating and isolating the 2-methyl-3-(alkylcarboxylate)quinoxaline-1,4-di-N-oxide reaction product formed in stage (a); and

(c) reacting the reaction product isolated in stage (b) with an excess of ethanolamine over the stoichiometric quantity to give the carbamoyl derivative.

4,228,284

BENZO[b,f]THIEPAN DERKVKTIVES

Shigeru Yamabe, Kobe; Yasuo Fujimoto, Tokyo; Shoji Ryu, Noda; Yoshio Suzuki, Misato; Yoshihiro Tanaka, Soka; Toru Yamanaka, and Kiyosato Nyu, both of Misato, all of Japan, assignors to Nippon Chemiphar Company, Limited, Tokyo, Japan

Division of Ser. No. 869,767, Jan. 16, 1978, Pat. No. 4,166,127, which is a division of Ser. No. 689,908, May 25, 1976, Pat. No. 4,101,667. This application Feb. 7, 1979, Ser. No. 10,320

Claims priority, application Japan, Oct. 28, 1975, 50-129490; United Kingdom, May 30, 1975, 23703/75

Int. Cl.² C07D *409/12*

U.S. Cl. 544—375 **1 Claim**

1. 9-(β-hydroxyethyl)piperazinylcarbonyl-2-trifluoromethyl-10,11-dihydrodibenzo[b,f]thiepin.

4,228,285

14-HYDROXY-6-OXAMORPHINANS AND 14-HYDROXY-6-OXAISOMORPHINANS

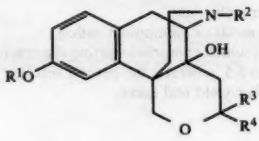
Thomas A. Montzka, Manlius; John D. Matiskella, and Richard A. Partyka, both of Liverpool, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,050

Int. Cl.² C07D *491/18*; A61K *31/435*

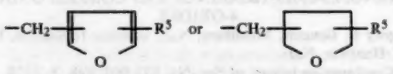
U.S. Cl. 546—63 **16 Claims**

1. A compound of the formula



I

wherein R^1 is hydrogen, (lower)alkyl, (lower)alkanoyl or nicotinoyl; R^2 is hydrogen, (lower)alkyl, propargyl, allyl, 3,3-dimethylallyl, cyclopropylmethyl, cyclobutylmethyl,



in which R^5 is hydrogen or (lower)alkyl, and R^3 and R^4 are the same or different and are hydrogen or (lower)alkyl, or R^3 and R^4, when taken together, represent an alkylene group of from 2 to 6 carbon atoms; or a pharmaceutically acceptable salt thereof.

4,228,286

INTERMEDIATES FOR 11-[3-OXO-ω(2- AND 3-FURYL)-LOWER-ALKYL]HEXAHYDRO-2,6-METHANO-3-BENZAZOCINES

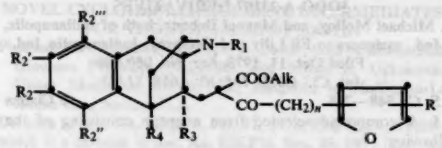
Thomas R. Lewis, Bethlehem, and William F. Michne, Poestenkill, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 36,060, May 4, 1979, which is a continuation-in-part of Ser. No. 886,781, Mar. 15, 1978, abandoned. This application Aug. 30, 1979, Ser. No. 71,744

Int. Cl.² C07D *221/26, 221/28*

U.S. Cl. 546—97 **3 Claims**

1. A compound having the formula



where R is hydrogen or lower-alkyl; R_1 is hydrogen, lower-alkyl, cyclo-lower-alkyl-lower-alkyl, phenyl-lower-alkyl, lower-alkenyl or lower-alkynyl; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is hydroxy, methoxymethoxy, lower-alkoxy or 2-tetrahydropyranyloxy; R_3 and R_4 are each hydrogen or lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_m-$, where m is one of the integers 3 and 4; n is one of the integers 1 and 2; and Alk is lower-alkyl.

4,228,287

PIPERIDINEMETHYL ETHERS

Cornelis van der Stelt, Haarlem, Netherlands, assignor to N.V. Koninklijke Pharmaceutische Fabrieken, Meppel, Netherlands

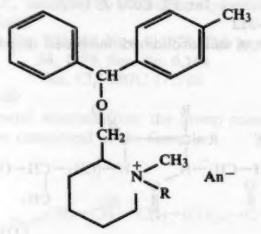
Filed Jul. 27, 1971, Ser. No. 166,641

Claims priority, application United Kingdom, Aug. 5, 1970, 37746/70

Int. Cl.[3] C07D *211/22*

U.S. Cl. 546—236 **2 Claims**

1. A non-toxic quaternary ammonium salt of 1-methyl-2-[[(p-methyl-α-phenyl-benzyl)oxy]methyl]piperidine of the formula



in which R represents a methyl group and an-a halogen or sulfate anion.

4,228,288

CERTAIN SUBSTITUTED 3,4,5,6-TETRAHYDROPYRIDINIUM SALT INTERMEDIATES

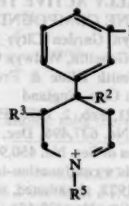
Dennis M. Zimmerman, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 965,137, Nov. 29, 1978. This application Aug. 27, 1979, Ser. No. 69,650

Int. Cl.[2] C07D *213/24, 213/28*

U.S. Cl. 546—339 **8 Claims**

1. A tetrahydropyridinium salt of the formula



wherein:

R^1 is hydrogen, hydroxy or methoxy;

R^2 and R^3 independently are C_1–C_5 alkyl;

R^5 is C_1–C_{10} alkyl, benzyl, or CH_2R^6 wherein R^6 is C_2–C_7 alkenyl or C_3–C_6 cycloalkyl; and

X^- is a suitable anion.

4,228,289

THIOLCARBAMATE DERIVATIVES OF 3-TRIHALOMETHYL-1,2,4-THIADIAZOLES

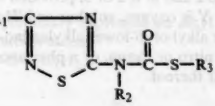
Walter A. Gay, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 6,060, Jan. 24, 1979. This application Dec. 10, 1979, Ser. No. 102,052

Int. Cl.[3] A01N *47/18;* C07D *285/08*

U.S. Cl. 548—128 **5 Claims**

1. A compound of the formula



wherein R_1 is CCl_3 or CF_3; R_2 is a hydrogen or a lower alkyl group of 1 to 4 carbon atoms; and R_3 is a lower alkyl group of 1 to 4 carbon atoms.

4,228,290

AMINO ESTER DERIVATIVES OF 3-TRIHALOMETHYL-1,2,4-THIADIAZOLES

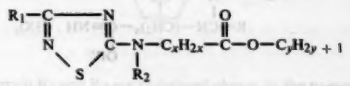
Eugene F. Rothgery, North Branford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 006,318, Jan. 25, 1979. This application Dec. 10, 1979, Ser. No. 102,053

Int. Cl.[3] A01N *43/80;* C07D *285/08*

U.S. Cl. 548—128 **5 Claims**

1. A compound of the formula



wherein R_1 is a CCl_3 or CF_3 group; R_2 is a hydrogen or a lower alkyl group of 1 to 4 carbon atoms; x is from 1 to 4; and y is from 1 to 5.

4,228,291
PHARMACOLOGICALLY ACTIVE THIADIAZOLE GUANIDINE COMPOUNDS

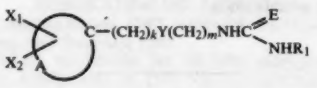
Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Genellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 764,921, Feb. 2, 1977, Pat. No. 4,137,237, which is a division of Ser. No. 637,496, Dec. 4, 1975, Pat. No. 4,022,797, which is a division of Ser. No. 450,957, Mar. 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Oct. 4, 1978, Ser. No. 948,358

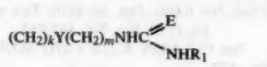
Int. Cl.[2] A61K *31/41*; C07D *285/12*

U.S. Cl. 548—138 6 Claims

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen, k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is NR_2; R_1 is hydrogen, lower alkyl or di-lower alkylamino-lower alkyl; and R_2 is hydrogen, nitro or cyano, or a pharmaceutically acceptable addition salt thereof.

4,228,292
N-SUBSTITUTED BENZOTHIAZOLINES AND BENZOXAZOLINES AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULANTS

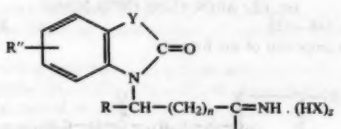
John J. D'Amico, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 20, 1978, Ser. No. 926,470

Int. Cl.[2] C07D *277/68*, *263/58*

U.S. Cl. 548—165 8 Claims

1. A compound having the formula



wherein R is hydrogen or lower alkyl; R' is lower alkyl; R'' is hydrogen, lower alkyl, halogen or lower alkoxy; Y is oxygen or sulfur; n is an integer from zero to two inclusive; X is an anionic moiety of a strong acid and z is zero or one.

4,228,293
IODO-A-23187 DERIVATIVES

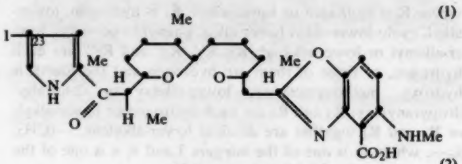
R. Michael Molloy, and Manuel Debono, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 11, 1978, Ser. No. 950,486

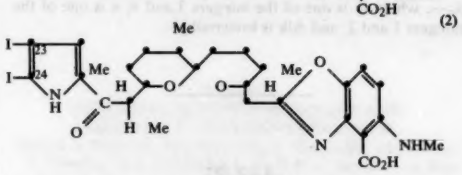
Int. Cl.[2] C07D *493/10*; A61K *31/42*

U.S. Cl. 548—216 3 Claims

1. A compound selected from a group consisting of the following:



(1)



(2)

and the pharmaceutically acceptable cationic salts of (1) and (2).

4,228,294
ESTERS OF IMIDAZOLIDINEDIONE-BASED DIEPOXIDES AND COATING COMPOSITIONS CONTAINING SAME

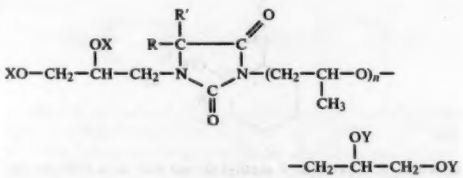
Ronald J. Lewarchik, Natrona Heights; J. Alden Erikson, Gibsonia, and William J. Birkmeyer, Oakmont, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 10, 1978, Ser. No. 950,105

Int. Cl. C07d *233/72*

U.S. Cl. 548—312 27 Claims

1. An ester of imidazolidinedione-based diepoxide having the structure:



wherein R and R' are independently hydrogen or hydrocarbon groups having from 1 to 8 carbon atoms, one X is hydrogen and the other X is

one Y is hydrogen and the other Y is

where the R'' groups are independently (a) alkyl groups having from 1 to 17 carbon atoms or (b) aryl or alkylaryl groups having from 6 to 10 carbon atoms and n is 0 or 1.

4,228,295

NOVEL CYCLOHEPTATHIOPHENE INTERMEDIATES FOR THE SYNTHESIS OF BIOTIN

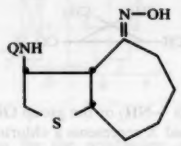
Pasquale N. Confalone; Elizabeth D. Lollar, both of Bloomfield; Giacomo Pizzolato, Belleville, and Milan R. Uskokovic, Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 929,870, Jul. 31, 1978, Pat. No. 4,175,086, which is a division of Ser. No. 836,876, Sep. 26, 1977, Pat. No. 4,124,595, which is a division of Ser. No. 771,218, Feb. 23, 1977, Pat. No. 4,062,868. This application Jun. 11, 1979, Ser. No. 47,199

Int. Cl.[2] C07D *333/80*

U.S. Cl. 549—57 3 Claims

1. A compound of the formula:



wherein Q is selected from the group consisting of hydrogen, $-COR_4$, $-COCX_3$ and tosyl where R_4 is lower alkyl and X is halogen, the racemates and optical antipodes thereof.

4,228,296

NOVEL 16-ARYLOXY-17,18,19,20-TETRANORPROSTANOIC ACIDS AND DERIVATIVES

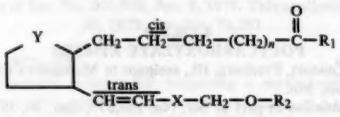
Charles V. Grudzinskas, Garnerville, N.Y., and Martin J. Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 520,064, Nov. 1, 1974. This application Jan. 24, 1979, Ser. No. 6,164

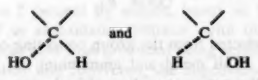
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—60 9 Claims

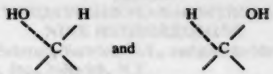
1. A compound selected from the group consisting of an optically active compound of the formula:



and a racemic compound of that formula and the mirror image thereof; wherein R_1 is hydroxy or alkoxy having from 1 to 12 carbon atoms; R_2 is a phenyl, benzyl, naphthyl, or 5,6,7,8-tetrahydronaphthyl group optionally substituted with one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl; n is an integer from 2 to 4, inclusive; X is a divalent moiety selected from the group consisting of those of the formulae:



Y is a divalent moiety selected from the group consisting of those of the formulae:



and the non-toxic cationic salts thereof when R_1 is hydroxy.

4,228,297

PROCESS FOR THE PRODUCTION OF HYDROXYALKYLPHENYL DERIVATIVES

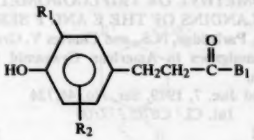
Joerg Haeberli, Warwick; Kyong P. Park, Cranston; Anthony F. Vellturo, N. Kingstown, and George F. Nuraberger, Warwick, all of R.I., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 763,220, Jan. 27, 1977, abandoned, which is a continuation of Ser. No. 596,129, Jul. 15, 1975, abandoned, which is a continuation of Ser. No. 505,286, Sep. 12, 1974, abandoned, which is a continuation of Ser. No. 318,801, Dec. 27, 1972, abandoned. This application Mar. 21, 1979, Ser. No. 22,395

Int. Cl.[2] C07C *69/76*

U.S. Cl. 560—75 19 Claims

1. An improved process for the production of a compound having the formula I



I,

wherein

R_1 and R_2 independently represent an alkyl group having from 1 to 6 carbon atoms,

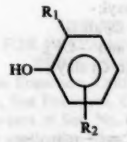
B_1 represents $-O-(C_xH_{2x})-H$ or

wherein x has a value from 6 to 30, inclusively,

Y_1 represent an alkyl group having from 1 to 18 carbon atoms or a cycloalkyl group having from 5 to 12 carbon atoms and

Y_2 represents hydrogen or an alkyl group having from 1 to 18 carbon atoms, a cycloalkyl group of 5 to 12 carbon atoms, or

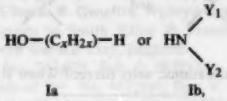
Y_1 and Y_2 together with the nitrogen atoms to which they are linked form a piperidino ring, which process comprises gradually adding methyl acrylate to a phenol compound of the formula



V

wherein R_1 and R_2 are as defined above, in the presence of from 0.001 to 10 mole percent, based on the phenol compound, of an alkaline catalyst, and, after completion of the reaction, adding to the resultant reaction mixture a compound selected from

(a) a monohydric alcohol or a monoamine of the formulae



Ia Ib,

wherein x, Y_1 and Y_2 are as defined above, the second reaction being carried out in the presence of from 0 to 10 mole percent of a second alkaline catalyst which is different from the first catalyst.

4,228,298

15-DEOXY-16-HYDROXY-16-FLUOROMETHYL, DIFLUOROMETHYL OR TRIFLUOROMETHYL PROSTAGLANDINS OF THE E AND F SERIES

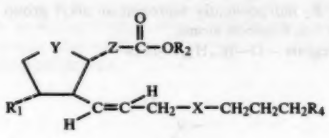
Sow-Mei L. Chen, Parkridge, N.J., and Charles V. Grudzinskas, Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1979, Ser. No. 46,724

Int. Cl.[3] C07C *177/00*

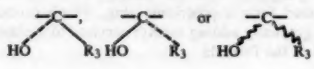
U.S. Cl. 560—121 **12 Claims**

1. An optically active compound of the formula:

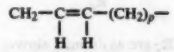


wherein Y is

X is:



R_1 is hydrogen or hydroxyl;
R_2 is hydrogen or C_1 to C_6 alkyl;
R_3 is $-CH_2F$, $-CHF_2$, and $-CF_3$;
R_4 is hydrogen, and C_1 to C_3 alkyl;
Z is



wherein p is 3 to 5, and the racemic mixture thereof; and when R_1 is hydrogen, the pharmaceutically acceptable salts thereof.

4,228,299

CHEMICAL PROCESS FOR PREPARING ALKYL ESTERS OR THE AMIDE OF 3-(β,β-DIHALOVINYL)-2,2-DIMETHYLCYCLOPROPANE -CARBOXYLIC ACID

Ian Ferguson, and Robert J. Lindsay, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

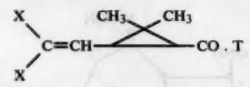
Filed Nov. 17, 1977, Ser. No. 852,557

Claims priority, application United Kingdom, Nov. 18, 1976, 48078/76; May 25, 1977, 22046/77

Int. Cl.[2] C07C *102/08, 67/22*

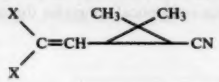
U.S. Cl. 560—124 **2 Claims**

1. A process for the preparation of a mixture of essentially cis-ester and amide compound of the formula:



(II)

wherein T represents $—NH_2$ or the group OR in which R is a lower alkyl group and X represents a chlorine atom or a bromine atom, which comprises treating a mixture of cis- and trans-nitrile of formula:



(V)

wherein X has the meaning stated above, with dry hydrogen chloride and an alcohol R.OH, wherein R has the meaning stated above, at a temperature at which only the trans-nitrile reacts, the cis-nitrile being left substantially unreacted, separating the unreacted cis-nitrile from the reaction mixture, followed by reaction of the cis-nitrile at an elevated temperature with dry hydrogen chloride and an essentially anhydrous alcohol R.OH and isolating from the reaction product the mixture of essentially cis- ester and amide compounds of formula (II).

4,228,300

POLYCARBOXYLATE ETHERS

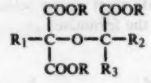
Kent P. Lannert, Freeburg, Ill., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 158,577, Jun. 30, 1971, abandoned, and a continuation-in-part of Ser. No. 158,540, Jun. 30, 1971, abandoned. This application May 15, 1972, Ser. No. 253,357

Int. Cl.[2] C07C *59/22*

U.S. Cl. 560—180 **10 Claims**

1. Compounds having the formula

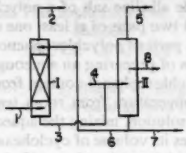


wherein R is selected from the group consisting of hydrogen, methyl, ethyl, alkali metal and ammonium; R_1 and R_2 are selected from the group consisting of hydrogen, methyl, and ethyl; and R_3 is selected from the group consisting of hydrogen, methyl, ethyl and COOR.

4,228,301
PROCESS FOR THE PREPARATION OF DIACETOXYBUTENE

Yoshinori Yoshida, and Hironobu Shinohara, both of Yokohama, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,441
Claims priority, application Japan, Oct. 21, 1977, 52-125825; Feb. 8, 1978, 53-12348
Int. Cl.[2] C07C 67/05
U.S. Cl. 560—244 4 Claims



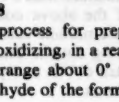
1. In a process for the production of diacetoxybutene wherein butadiene, acetic acid and oxygen are reacted in the presence of a catalyst and an inert gas to produce said diacetoxybutene and a discharge gas composed mainly of butadiene, acetic acid, oxygen and an inert gas released from the reaction, the improvement comprising separating said discharge gas into a first portion which is circulated back to the reaction for reuse and a second portion which is supplied to an absorption tower wherein said second portion is contacted with diacetoxybutene, diacetoxybutane or a mixture thereof.

4,228,302
PROCESS FOR PREPARING A METHYL-SUBSTITUTED BENZALDEHYDE

Carl A. Renner, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 001,930, Jan. 8, 1979. This application Aug. 30, 1979, Ser. No. 71,281
Int. Cl.[2] C07C 51/26
U.S. Cl. 562—408 6 Claims

1. Improved process for preparing a methyl-substituted benzoic acid by oxidizing, in a reaction mixture, at a temperature within the range about 0° to 120° C., the methyl-substituted benzaldehyde of the formula



m is 2, 3, 4 or 5, with an excess of oxygen, in the presence of about 0.01 to 2 percent by weight, based on the weight of aldehyde, of an autoxidation initiator, with the methyl-substituted benzoic acid thus produced being separated from the reaction mixture and recovered, the improvement characterized in that the oxidation reaction is carried out in the reaction mixture in the presence of at least 0.5 molar equivalent, per mole of aldehyde, of cyclohexanone as a reductant.

4,228,303
3-(3,4-DIHYDROXYPHENYL)-N-(4-NITROBENZYL)ALANINE HYDROBROMIDE

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,512
Int. Cl.[3] C07C 79/46
U.S. Cl. 562—435 1 Claim

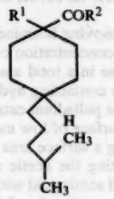
1. The compound 3-(3,4-dihydroxyphenyl)-N-(4-nitrobenzyl)alanine hydrobromide.

4,228,304
NOVEL CYCLOHEXANECARBOXYLIC ACID AND ITS DERIVATIVES

Kanji Noda, Chikushino; Akira Nakagawa; Kenji Yamagata, both of Tosu; Terumi Hachiya, Chiyoda; Hiroyuki Ide, Fukuoka, and Akihide Koda, Gifu, all of Japan, assignors to Hisamitsu Pharmaceutical Co. Inc., Saga, Japan

Filed Apr. 11, 1978, Ser. No. 895,485
Claims priority, application Japan, Jun. 16, 1977, 52-72639
Int. Cl.[3] C07C 103/50
U.S. Cl. 562—507 3 Claims

1. A compound of the formula:



wherein R^1 is hydrogen or methyl and R^2 is amino acid rest which is selected from the group consisting of the rest of glutamic acid, aspartic acid, α-aminoadipic acid, α-aminopimelic acid, glutamine, cysteic acid, homocysteic acid, 2-aminoeicosandicarboxylic acid, glycine, phenylalanine, phenylalanine, phenylglycine, alanine, α-aminobutyric acid, valine, norvaline, leucine, isoleucine, norleucine, p-nitro-phenylalanine, methionine, cystein, homocystine, penicillamine, ethionine or a lower alkyl ester thereof; threonine, serine, β-hydroxyleucine, or homoserine; the N-methyl or N-ethyl derivative of sarcocine; the o-acyl or o-methyl derivative of serine; a N^{ω},N^{ω}-dilower alkyl derivative of lysine, or a N^{ω}, N^{ω}-dilower alkyl derivative of ornithine; β-alanine, or β-aminoisobutyric acid; and γ-aminovaleraic acid, ε-aminocaproic acid or the N-methyl or N-ethyl derivative thereof.

4,228,305
PROCESS FOR PREPARING ACETIC ACID DERIVATIVES

Shigeto Suzuki, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 861,070, Dec. 15, 1977, abandoned. This application May 7, 1979, Ser. No. 36,473
Int. Cl.[2] C07C 59/06
U.S. Cl. 562—579 4 Claims

1. A process for preparing glycolic acid which comprises contacting a reaction mixture comprising formaldehyde, formic acid and liquid hydrogen fluoride catalyst at a temperature of from about 0° C. to about 100° C.

4,228,306

PHENYLENE SUBSTITUTED POLYMERIC DIALKYL PEROXIDES

Roger N. Lewis, Martinez, and Lawrence A. Bock, Redwood City, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 819,318, Jul. 27, 1977, Pat. No. 4,146,583.
This application Nov. 1, 1978, Ser. No. 956,712
The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.
Int. Cl.[3] C07C *179/035, 179/047*
U.S. Cl. 568—563 8 Claims

1. A method for making a phenylene substituted dialkyl peroxide comprising: etherifying a diol selected from 1,4-bis(-hydroxyisopropyl)benzene and 1,3-bis(hydroxyisopropyl)benzene with a dihydroperoxide selected from 2,5-dimethyl-2,5-dihydroperoxyhexane, 2,5-dimethyl-2,5-dihydroperoxyhexyne-3, and 3,6-dimethyl-3,6-dihydroperoxyoctane, said diol and dihydroperoxide being present in co-reactive amounts and under conditions which permit etherification therebetween, and recovering the organic peroxide reaction product.

4,228,307

REMOVAL OF BROMINE FROM ACETIC ACID

Wilford J. Zimmerschied, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 18, 1978, Ser. No. 970,226
Int. Cl.[2] C07C *51/42, 53/08;* B01J *1/22, 8/02*
U.S. Cl. 562—608 5 Claims

1. The method of removing bromine from acetic acid of 95 to 100 weight percent concentration contaminated with ionic and co-ordinate bromine in a total amount of from 0.0005 to 0.015 weight percent by contacting hydrogen and said contaminated acetic acid with a palladium catalyst having Pd crystallites dispersed on the surface of low extraneous metal content activated carbon having a surface area to unit mass ratio of at least 800 m^2/g, separating the acetic acid from the catalyst, contacting the separated acetic acid with a solid absorbant, and separating acetic acid from the absorbant.

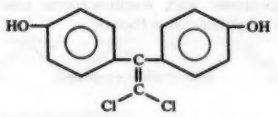
4,228,308

DEHYDROCHLORINATION OF A DIHYDROXYDIPHENYL TRICHLOROETHANE

Michael R. Mac Laury, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1979, Ser. No. 37,436
Int. Cl.[3] C07C *39/367*
U.S. Cl. 568—726 6 Claims

1. In a process for dehydrohalogenating the trichloride, 1,1,1-trichloro-2,2-bis-(4-hydroxyphenyl) ethane, to form the dichloride of the formula



which process comprises (1) treating the aforesaid trichloride with liquid methyl amine in an amount sufficient to act as both a dehydrohalogenating agent and solvent, the improvement comprising the said methyl amine in combination with an amount of a salt effective to accelerate the dehydrohalogenation reaction, wherein said salt is selected from the class consisting of methyl amine hydrochloride and hydrobromide, ethyl amine hydrochloride and hydrobromide, dimethyl amine hydrochloride and hydrobromide, ammonium chloride and bromide, lithium chloride and bromide, and sodium chloride and bromide, to form a substantially pure dichloride of the above formula, and (2) removing the unreacted methyl amine and salt thereby isolating the desired dichloride, the said salt being used in an amount ranging from 0.5 to 20%, by weight, based on the weight of the methyl amine.

4,228,309

CYCLOHEXANE EXTRACTION TO REMOVE CHLORODIBENZO-P-DIOXINS

David B. Hatcher, 8433 Katy Freeway, Houston, Tex. 77024

Continuation-in-part of Ser. No. 876,999, Feb. 13, 1978, abandoned. This application Apr. 20, 1979, Ser. No. 32,100
Int. Cl.[3] C07C *37/70*
U.S. Cl. 568—755 7 Claims

1. A method of removing chlorodibenzo-p-dioxin impurities from a water-soluble alkaline salt of a polychlorophenol that contains up to about two parts of at least one chlorodibenzo-p-dioxin per thousand parts of polychlorophenol, as an impurity, comprising the steps of preparing an aqueous solution of such a salt having a polychlorophenol content from about 0.5% to about 30%, at a temperature from room temperature to the boiling point of the solution, mixing the aqueous solution with one-tenth to ten times its volume of cyclohexane to extract the dioxins therefrom, and decanting the purified aqueous solution from the cyclohexane phase.

4,228,310

POLYOL PREPARATION

George P. Speranza; Robert L. Zimmerman, and Thomas H. Austin, all of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.

Continuation of Ser. No. 916,991, Jun. 19, 1978, abandoned.
This application Mar. 19, 1979, Ser. No. 21,517
Int. Cl.[2] C07C *43/11, 41/02*
U.S. Cl. 568—620 10 Claims

1. A method of preparing a polyether polyol useful in making a polyisocyanurate polymer, which comprises the steps of oxyalkylating an alcohol having a functionality of two or three by the catalytic addition of an alkylene oxide to said alcohol in presence of an oxyalkylating catalyst selected from the group consisting of aminophenols, hexahydro-s-triazines and tetrahydrooxadiazines.

4,228,311

SELECTIVE DEALKYLATION OF 4-TERTIARY-ALKYL-2,5-XYLENOL

John R. Dodd, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Jun. 8, 1979, Ser. No. 47,190
Int. Cl.[2] C07C *39/06, 37/22*
U.S. Cl. 568—805 9 Claims

1. An improved method for selectively dealkylating 4-t-alkyl-2,5-xylenol when in admixture with 6-t-alkyl-2,4-xylenol by contacting a mixture of the above components with a strongly acidic polymer-bound sulfonic acid catalyst, the improvement comprising carrying out the dealkylation at temperatures equal to or less than 60° C. and pressures of from about 0.5 to about 5 atmospheres.

4,228,312

HYDROGENATION PROCESS

Jan G. Noltes, Huis Ter Heide; J. T. B. H. Jastrzebski, De Bilt, and Gerard van Koten, Bilthoven, all of Netherlands, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 7, 1979, Ser. No. 18,374
Int. Cl.[2] C07C *5/02, 5/06, 5/08, 5/10*
U.S. Cl. 585—250 6 Claims

1. A process for the hydrogenation of aromatic, olefinic and acetylenic compounds comprising treating such compounds, which contain no nitrogen, phosphorous, tin or halogen, with hydrogen in the presence of a zero-valent mixed metal catalyst prepared by reacting an aliphatic metal cluster compound of the formula $R_{x+y}M_xLi_y$ where R is alkyl of 1–12 carbon atoms, M is a Group IB metal, x and y are each 1–4, and x+y

is 2–8, with a metal halide complex of the formula RhX_aL_b wherein X is chlorine or bromine, L is an olefinic hydrocarbon ligand, a is 1–3 and b is 1–4, in a hydrocarbon solvent.

4,228,313

COUPLING REACTION INVOLVING A GRIGNARD AND ALLYLIC HALIDE

Carlos G. Cardenas, and Zia U. Din, both of Jacksonville, Fla., assignors to SCM Corporation, N.Y.

Division of Ser. No. 786,973, Apr. 13, 1977, abandoned, which is a continuation-in-part of Ser. No. 596,273, Jul. 16, 1975, abandoned, Ser. No. 596,426, Jul. 16, 1975, abandoned, Ser. No. 596,274, Jul. 16, 1975, abandoned, and Ser. No. 596,361, Jul. 16, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,668

Int. Cl.[3] C07C *1/26*

U.S. Cl. 585—640 **12 Claims**

1. A process for the synthesis of long chain compounds having at least one point of unsaturation from an aliphatic or araliphatic hydrocarbon of shorter length having an alkyl, alkenyl or aralkyl radical R and an unsaturated hydrocarbon having a terminal isopropenyl or isopropylidene group and zero or more additional points of double-bond unsaturation, comprising

halogenating said unsaturated hydrocarbon to produce an allylic halide having a terminal olefinic site and a halogen atom allylic to said site;

forming the Grignard RMgX of said aliphatic or araliphatic hydrocarbon, X being halogen;

preparing a reaction mixture comprising said Grignard and said allylic halide; and

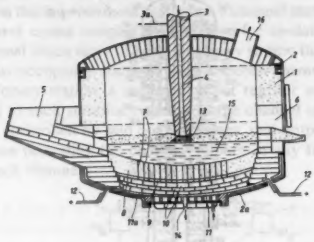
removing from said reaction mixture a compound in which coupling of the Grignard and allylic halide occurs by displacement by R of the Grignard at the terminal olefinic site of the allylic halide accompanied by double bond migration and loss of halide.

4,228,314

DC ARC FURNACE HEARTH

Sven-Einar Stenkvist, Vesteras, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Feb. 27, 1979, Ser. No. 15,587
Claims priority, application Sweden, Feb. 28, 1978, 7802240
Int. Cl.[2] H05B 7/00
U.S. Cl. 13—9 R 6 Claims



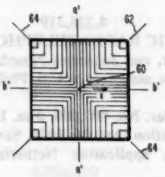
1. A DC arc furnace comprising an electrically conductive hearth adapted to contain a melt, at least one arcing electrode having a tip positioned substantially centrally above the hearth and adapted to form an arc with the melt, and means for connecting said electrode and hearth with DC power; wherein the improvement comprises said hearth comprising a substantially electrically non-conductive refractory compound rammed on a layer of electrically conductive bricks, and a cluster of vertically elongated metal elements which each extend through said compound from the top of the compound downwardly to electrical connection with said layer, said cluster extending from below said tip in all radial directions throughout an area large enough to carry DC power to a melt in the hearth and which is adequate to power said arc, and said bricks resting on a metal plate that is at least coextensive with said area and having means for connecting with said power.

4,228,315

SOLAR CELL GRID PATTERNS

Louis S. Napoli, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1979, Ser. No. 36,039
Int. Cl.[3] H01L 31/04
U.S. Cl. 136—256 12 Claims



1. A solar cell having an electrode grid pattern on its light receiving surface comprising:

a plurality of conductors arranged in a symmetrical pattern; one part of the pattern comprising, relative to a line extending toward the center region of the cell from an edge of the cell, a plurality of parallel conductors spaced from one another, each conductor subtending an angle which is bisected by the line at the crossing of that conductor with the line, each conductor terminating at both its ends at the peripheral edge portion of the cell, each conductor comprising a first portion on one side of the line which is a mirror image of a second portion on the other side of the line, each conductor thus being symmetrical relative to said line, said one part of the pattern occupying a 90° quadrant which is bisected by the line,

a second part of the pattern comprising a mirror image of the first part of the pattern;

third and fourth parts of the pattern comprising a mirror image of said first and second parts of the pattern, respectively, and

a common bus extending along said peripheral edge portion of the cell and in conductive contact with all of said conductors at their respective opposite ends,

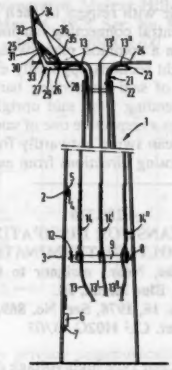
the spacing between different pairs of said parallel conductors being different, the spacing between those conductors closest to the peripheral edge being the greatest.

4,228,316

HOLLOW POLE WITH INTERNAL WIRE GRIPPING AND SECURING MEANS

John H. T. MacFarlane, Middlesex, England, assignor to The Post Office, London, England

Filed Oct. 2, 1978, Ser. No. 947,954
Claims priority, application United Kingdom, Oct. 4, 1977, 41242/77
Int. Cl.[2] H02G 7/20; F16G 11/00
U.S. Cl. 174—45 R 7 Claims



1. In combination, a hollow pole and means located internally thereof for securing and retaining an electric wire, said means comprising;

an annular anchor ring secured in concentric spaced relation to the inner wall surface of said hollow pole;

a unitary anchoring member consisting of an elongate helical section terminating in a looped clasp having a hooked end;

the diameter of said helical section being sized to receive and grip an electrical wire, and said hooked end engaging said anchoring ring for retaining a wire gripped by said helical section in said hollow pole.

4,228,317

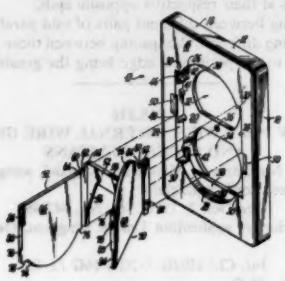
PROTECTIVE FACE PLATE FOR AN ELECTRICAL OUTLET

Norbert Cziment, 1881 49th St., Brooklyn, N.Y. 11204

Filed Nov. 13, 1978, Ser. No. 959,674
Int. Cl.[2] H05K 5/03
U.S. Cl. 174—67 15 Claims

1. A face plate for an electrical outlet, said face plate comprising a base member having an outer shell adapted to be positioned over the electrical outlet, a recessed compartment provided within said outer shell and including a bottom wall having a pair of socket openings for alignment with a duplex socket receptacle disposed within the electrical outlet, a removable insert member received in said recessed compartment

over said socket openings and providing in cooperation with said outer shell a substantially flush surface, said insert member having a pair of covers, each of said covers being selectively openable to uncover a respective one of said socket openings disposed therebeneath, cooperating securing means on said base member and said insert member for securely retaining said insert member in said recessed compartment, said base and insert members each being symmetrically structured so as to be



reversibly positionable with respect to each other, said insert member including central connecting bar means through upright sections lying in a common plane with said connecting bar means, said upright sections opposedly extending perpendicularly from ends of said connecting bar means, integral hinges forwardly extending from said upright sections, each cover being coupled to a respective one of said integral hinges, whereby said covers can swing outwardly from said connecting bar means in opposing directions from each other.

4,228,318

METHOD AND MEANS FOR DISSIPATING HEAT IN A HIGH VOLTAGE TERMINATION

Jorgen Selsing, Omaha, Nebr., assignor to G & W Electric Specialty Company, Blue Island, Ill.

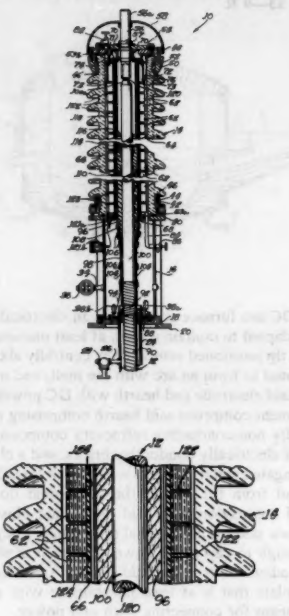
Filed Jan. 16, 1978, Ser. No. 869,670

Int. Cl.[2] H02G *15/02*

U.S. Cl. 174—73 R **13 Claims**

1. In a graded capacitor type high voltage cable termination which includes, in combination, the prepared end of a high voltage cable having an axial conductor, an outer annular insulator disposed coaxially over said prepared end of said cable and defining a space therebetween, and a plurality of annular capacitor elements disposed over said prepared end of said cable in stacked relation within said space so that regions of substantially parallel equipotential planes are established between said stacked capacitors; the improvement comprising thermally conductive means interposed between at least two adjacent ones of said stacked capacitors and having thermal communication with the area inwardly of said capacitors, said thermally conductive means being substantially parallel to said parallel equipotential planes and having an inner opening defined by an inner peripheral edge surface of said conductive means, said conductive means having a configuration such that said inner peripheral edge surface lies wholly within the region between said adjacent capacitors in which the equipotential planes are substantially parallel.

12. A method of dissipating heat from an electrical high-voltage cable termination which includes, in combination, a prepared end of a high voltage electric cable having an axial conductor, an insulation layer immediately overlying said cable in coaxial relation thereon, and an outer conductive sheath layer coaxial along said insulation layer; said sheath and insulation layers being stripped back so as to expose predetermined lengths of said axial conductor and said insulation layer, a stack of annular capacitors disposed coaxially along said cable juxtaposed to said exposed axial conductor and said insulation layer so as to distribute electric stress along the length of said insulation layer and establish regions of substantially parallel equipotential planes between said stacked capacitors, and an annular insulator disposed coaxially over said stack of capacitors, said method comprising inserting an annular thermally conductive disc between each pair of said stacked capacitors within the region of substantially parallel equipoten-



tial planes between each pair of said stacked capacitors so that each of said discs has thermal communication with the area inwardly of said annular capacitors and is adapted to transfer heat generated by said axial conductor internally of said stacked capacitors to the area outwardly of said capacitors, said conductive discs being positioned to lie wholly within said regions of substantially parallel equipotential planes.

4,228,319

AUTOMATIC RADIO TELEPHONE SYSTEM

Johan B. De Jager, and Johannes Noordanus, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 807,005, Jun. 16, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 955,067

Claims priority, application Netherlands, Jul. 2, 1976, 7607300

Int. Cl.[2] H04M *7/04*

U.S. Cl. 179—2 EB **3 Claims**

1. An automatic radio telephone system having:

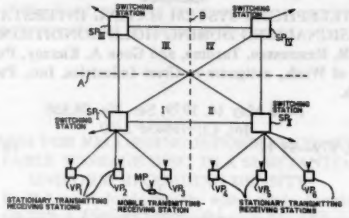
a plurality of mobile transmitting-receiving stations, a plurality of stationary transmitting-receiving stations which can be coupled through a plurality of duplex speech channels to said mobile transmitting-receiving stations, a common switching station means coupled to said stationary stations for establishing any desired connection between said mobile stations or between said mobile stations and the subscribers of a line-wire telephone network,

each one of said stationary transmitting-receiving stations comprising at least a transmitting means for continuously transmitting a signal on an individual call channel frequency which is specific for each stationary station, and

furthermore each stationary station having means for using a plurality of duplex speech channels,

each one of said mobile transmitting-receiving stations comprising a duplex speech channel selector and a call channel selector means for selecting the call channel frequency which is locally received strongest and which automatically tunes the mobile transmitting receiving station for reception on the selected call channel,

wherein the improvement comprises a channel status store, a control means coupled to said store for up-dating in the channel status store of each stationary station the instantaneous occupancy status of duplex speech channels of that stationary station, a separate output register means coupled to each stationary station to the channel status store and controlled by said control means, said output register means providing the channel number of any free duplex speech channel,



the transmitter means present in each stationary station continuously transmitting a signal on the call channel frequency which is specific for the stationary station, said call channel frequency signal being modulated by a code which is representative of the channel number provided by said output register, and

each mobile station comprising a demodulator means and a storage register means for respectively demodulating and storing in said storage register the channel number transmitted over the received call channel, and a control device means coupled to said duplex speech channel selector for automatically tuning in response to a connection set-up command the transceiver of the mobile station to the duplex speech channel indicated by the channel number stored in said storage register.

4,228,320

NOISE DETECTOR FOR FREQUENCY MODULATION SYSTEMS

John R. Celli, Long Branch, and Donald H. Nash, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 2, 1978, Ser. No. 957,299
Int. Cl.[2] H04Q 7/04
U.S. Cl. 179—2 EA **10 Claims**

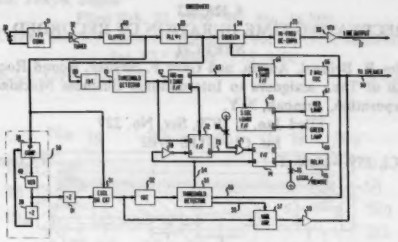
1. A noise detector for a frequency modulated transmission system

characterized by

a phase-locked loop adapted to track the modulating signals of frequency modulated signals received in said transmission system,

an exclusive OR circuit,

means for applying said frequency modulated signals to said phase-locked loop and to said exclusive OR circuit, and



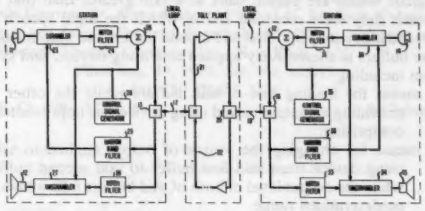
means for integrating the output of said exclusive OR circuit.

4,228,321

PRIVACY TRANSMISSION SYSTEM WITH REMOTE KEY CONTROL

James L. Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1978, Ser. No. 906,328
Int. Cl.[3] H04K 1/00
U.S. Cl. 179—1.5 S **5 Claims**



1. In a two-way privacy communication system (FIG. 1) including a transmission link having separate paths (21,22) for opposite transmission directions between first and second stations, said first station having multikey scrambling means (23) and multikey unscrambling means (27) and said second station having multikey scrambling means (30) and multikey unscrambling means (34) CHARACTERIZED IN THAT

means (35) for generating a first key control signal is provided at said second station,

means also at said second station applies said first control signal to said unscrambling means (34),

means (16,18) further at said second station transmits said first control signal over one unidirectional path (22) to said first station,

means (28) for generating a second key control signal is provided at said first station,

means also at said first station applies said second control signal to said unscrambling means (27),

means (13,17) further at said first station transmits said second control signal over another unidirectional path (21) to said second station,

means (29) at said first station applies said first key control signal received from said second station to said scrambling means (23) to control the scrambling of messages to be transmitted by said first station over another unidirectional path (21) to said second station, and

means (36) at said second station applies said second key control signal received from said first station to said scrambling means (30) to control the scrambling of mes-

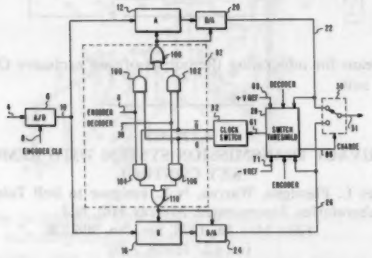
sages to be transmitted by said second station over one unidirectional path (22) to said first station.

4,228,322

DECREASING TIME DURATION OF RECORDED SPEECH

Charles R. Bringol, Austin, and Gary F. Snyder, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1979, Ser. No. 227
Int. Cl.[3] G11B *5/02*
U.S. Cl. 179—15.55 T **9 Claims**



1. In a system for time compression of prerecorded speech signals which are played back at a rate greater than that at which they were recorded and in which the input speech is loaded alternately into first and second buffers and output from the buffers is alternatively applied to a using device, said system including

means for loading one of said buffers while the other is providing an output to said using device, the improvement comprising:

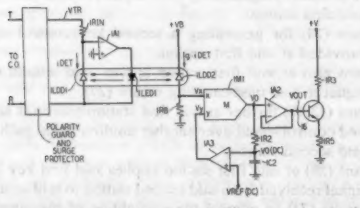
means for changing the source of output applied to said using device from said first buffer to said second buffer when the output level of both of said buffers falls within a predetermined range.

4,228,323

VARIABLE LOOP LENGTH COMPENSATED BARRIER CIRCUIT

Alexander Feiner, Rumson; Chao Kai Liu, Matawan, and Sigurd G. Waaben, Princeton, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 893,794, Apr. 5, 1978, abandoned. This application Jan. 31, 1979, Ser. No. 8,194
Int. Cl.[2] H04B *9/00*
U.S. Cl. 179—16 F **16 Claims**



11. An isolation device having an input terminal and an output terminal said terminals separated by an interface, the input side of said interface containing transmitting means operable for providing transmission across said interface in accordance with input AC and DC transmission signals, and the output side of said interface containing detecting means operable under control of received transmission for providing an output transmission signal representative of said input transmission signal, said device including

means on said input side of said interface for generating a bias signal proportional to said input DC signal,

means for applying said generated bias signal to said transmitting means so that one component of said transmission across said interface is a function of said input DC transmission signal as well as a function of the physical characteristics of said interface,

means for comparing a reference DC voltage level to a DC voltage level generated by said detecting means as a result of transmission received across said interface, said

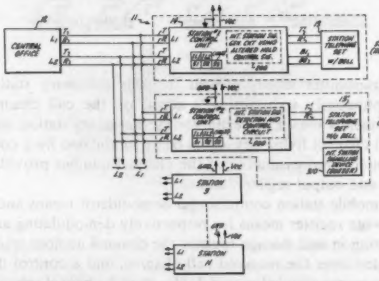
means on said output side of said interface for modifying the AC gain of said output transmission signal in accordance with said compared voltage levels.

4,228,324

KEY TELEPHONE SYSTEM HAVING INTERSTATION SIGNALLING DURING HOLD CONDITION

Harry R. Rasmussen, Tacoma, and Gene A. Kimzey, Puyallup, both of Wash., assignors to Crest Industries, Inc., Puyallup, Wash.

Filed May 14, 1979, Ser. No. 38,830
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—99 H **10 Claims**



10. In a telephone hold control system for selectively generating and applying a hold control signal to a telephone line at a first station, and for receiving such hold control signal on such line at a second station, the improvement in combination therewith comprising:

interstation signalling means associated with the first station for selectively altering said hold control signal so as to apply an altered hold control signal to the telephone line thereat;

interstation signal detection means associated with a second station for detecting said altered hold control signal received thereat; and

interstation signal utilizing means disposed at the second station and being responsive to said detection means.

4,228,325

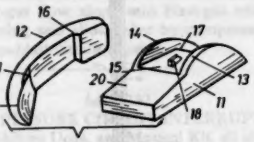
TELEPHONE SET

Knut H. Blomberg, Lokattsvägen 39, S-161 37, Bromma, Sweden

Filed Jun. 19, 1978, Ser. No. 916,748
Claims priority, application Sweden, Jul. 5, 1977, 7707799
Int. Cl.[2] H04M *1/02*
U.S. Cl. 179—100 R **4 Claims**

1. A telephone set comprising a base, and a handset supportable on the base, said handset including a lower microphone part, an upper earphone part and a connecting handle part, said base including a cradle in which said handset can be supported at rest in a position in which the microphone part and earphone part project beyond the cradle and face downwardly, said cradle including upwardly projecting flanges forming a groove therebetween, which flanges flank said handle part over at

least a major part of the length thereof and extend at least the height thereof to prevent the handle part of the handset from being engaged to lift the handset from the base, said lower microphone part being shaped and proportioned such that it is



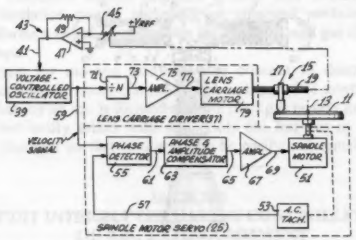
enlarged with respect to said handle part and forms bowl-shaped recesses at the edges formed between the microphone part and the handle part, said recesses receiving the ends of fingers of the hand gripping the microphone part without covering the sound inlet of the microphone part.

4,228,326

SYSTEM FOR RECORDING INFORMATION ON A ROTATABLE STORAGE DISC, IN A SUBSTANTIALLY UNIFORM RECORDING DENSITY

Wayne R. Dakin, Redondo Beach, and Ludwig Ceshkovsky, Fountain Valley, both of Calif., assignors to MCA Discovision Inc., Universal City, Calif.

Filed Nov. 16, 1978, Ser. No. 961,405
Int. Cl.[2] G11B *19/24*
U.S. Cl. 179—100.1 G **8 Claims**



2. Apparatus for recording information on an information storage disc, wherein the information is recorded in plurality of substantially circular and concentrically arranged information tracks, said apparatus comprising:

transducer means movable radially relative to the disc to be positioned in a prescribed relationship relative to a selected one of the information tracks;

means for producing a velocity signal having a frequency substantially inversely proportional to the radius of the selected track;

motor means for rotating the disc;

tachometer means coupled to said motor means for producing a tachometer signal having a frequency proportional to the angular velocity of said motor means; and

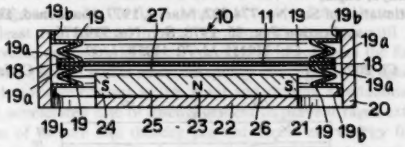
phase detector means for comparing the respective phase angles of the tachometer signal and the velocity signal, and for producing a control signal indicative of the phase difference thereof, said control signal being coupled to said motor means to appropriately control its angular velocity, whereby the selected information track is moved at a substantially constant linear velocity relative to said transducer means and a substantially uniform information recording density is achieved.

4,228,327

ELECTROMAGNETIC TYPE ACOUSTIC TRANSDUCERS

Tadashi Sawafuji, No. 9-15, Nishi-Sugamo, 1-chome, Toshima-ku, Tokyo, Japan

Filed Feb. 23, 1979, Ser. No. 14,301
Claims priority, application Japan, Feb. 25, 1978, 53-22931[U]
Int. Cl.[2] H04R *7/18, 9/02*
U.S. Cl. 179—115.5 ES **5 Claims**



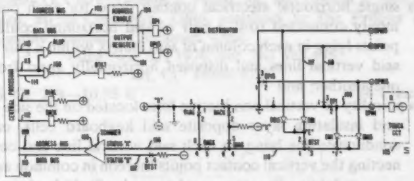
1. An electromagnetic type acoustic transducer comprising a vibratable diaphragm including a conductor and disposed within a magnetic field defined by a permanent magent, support members which are expandable and contractible in the direction at right angles with said diaphragm and are fixed to both surfaces thereof, and a frame to which said support members are fixed such that the expansion and contraction thereof are not prevented.

4,228,328

SIGNAL DISTRIBUTOR TEST ARRANGEMENT

Louis Gawron, Jr., Reynoldsburg; Vincent H. Lindisch, Columbus, and John P. Petrucci, Pataskala, all of Ohio, assignors to Western Electric Company, Inc., New York, N.Y.

Filed Aug. 13, 1979, Ser. No. 66,017
Int. Cl.[3] H04M *3/26*
U.S. Cl. 179—175.2 R **9 Claims**



3. For use in testing a plurality of distributor circuits of a signal distributor wherein each distributor circuit comprises an individual switch effective when enabled for interconnecting an energizing potential on an input with a first output and effective when disabled for connecting said input with a second output, said outputs being connectable to circuits for energization thereof

CHARACTERIZED BY

a first plurality of diodes each coupling a corresponding one of said first outputs to a first switch circuit node,

means coupling said switch inputs to a second circuit node,

a second plurality of diodes each coupling a corresponding one of said second switch outputs to a third circuit node,

a potential source,

a detector responsive to said source, and

multistate circuit means being effective when actuated in a first state for coupling said source and detector to said first and second nodes, respectively, to ascertain the selective enablement of each switch; effective when actuated in a second state for coupling said source and detector to said second and first nodes, respectively, to ascertain the continuity of said first diodes; effective when actuated in a third state for coupling said source and detector to said third and second nodes, respectively, to ascertain the selective disablement of each said switch; and effective when actu-

ated in a fourth state for coupling said source and detector to said second and third nodes, respectively, to ascertain continuity of said second diodes.

4,228,329

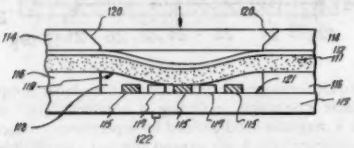
COMPACT KEYBOARD STRUCTURE

Fumiyuki Inose, San Jose; Hirohide Endo, and Akio Komatsu, both of Cupertino, all of Calif., assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 774,982, Mar. 7, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,276

Int. Cl.[2] H01H *13/70*; H05K *1/00*

U.S. Cl. 200—5 A **2 Claims**



1. A keyboard structure including:

a matrix of rows and columns of keyboard cells on an insulating layer, each cell including a first and second contact element electrically connectable by an overlying conductive membrane;

means for electrically connecting in common each of the first contact elements in each respective row of said matrix;

a plurality of vertical electrical contact points, one located on each second contact element and penetrating through said insulating layer, the vertical contact points of each second contact element in the same column being located upon a vertical line;

a single horizontal electrical contact point for each commonly connected row, a pair of said horizontal contact points lying in each column of said matrix within a pair of said vertical lines and disposed horizontally apart from one another; and

a plurality of vertical conductive lines located on the side of said insulating layer opposite said keyboard cells, one conductive line lying on each said vertical line and connecting the vertical contact points thereon in common and one conductive line connected to each of said horizontal contact points.

4,228,330

TOUCH PANEL MECHANISM

Gerald L. Larson, Minnetonka, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 10, 1978, Ser. No. 923,305

Int. Cl.[3] H01H *13/70*

U.S. Cl. 200—5 A **10 Claims**

1. In a touch panel switch device having switch contactors positioned on a flexible, non-conductive surface aligned with respective switch contacts positioned on an opposite non-conductive surface to provide a plurality of switch contact positions, said flexible surface being depressable to enable engagement between a respective contactor and contact, the improvement comprising:

a non-conductive spacer intermediate said surfaces including apertures therein extending over more than one of said switch contact positions; and

a thin metal sheet overlying and immediately adjacent said flexible, non-conductive surface, said metal sheet being depressable at a switch contact position to depress said non-conductive surface and only enable engagement of the respective contactor and contact associated therewith wherein the thickness of said non-conductive spacer and the stiffness of said thin metal sheet combine to provide

said touch panel switch device with the hard tactile feel characteristic of glass-capacitive touch panels.

4,228,331

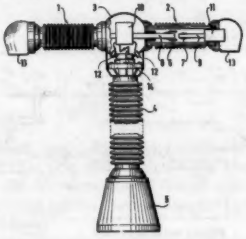
GAS-BLAST VALVE OF A GAS-BLAST CIRCUIT-BREAKER

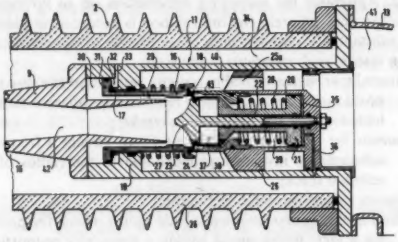
Armand Scarato, Lyon, France, assignor to Société Anonyme Dite: Delle-Alsthom, Villeurbanne, France

Filed Feb. 7, 1979, Ser. No. 10,283

Int. Cl.[3] H01H *33/82*

U.S. Cl. 200—144 R **4 Claims**





1. A gas-blast circuit breaker including at least one cut-out chamber, a gas blast-valve mounted within said cutout chamber for axial movement between open and closed position, means defining two seats for said gas-blast valve, one seat of which, when the gas-blast valve is opened, is situated on the blast-gas exit path, the improvement comprising a slide valve, means for mounting said slide valve within said chamber for

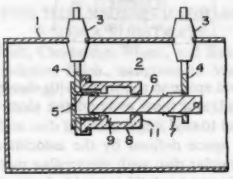
operative sliding movement relative to said gas-blast valve, means for moving said gas blast-valve from closed to open position, and means responsive to the opening of said gas blast-valve to cause a slightly delayed movement of said slide valve in the same direction as the gas-blast valve and along the same axis to mask said one valve seat situated on the exit path from hot blast-gas flow along said blast-gas exit path, and means for opening said slide valve by compressed gas contained in the gas-blast circuit-breaker.

4,228,332

GAS PRESSURE CIRCUIT INTERRUPTER

Koji Ibuki; Yoshihiro Ueda, and Masami Kii, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1978, Ser. No. 889,878
Claims priority, application Japan, Mar. 24, 1977, 52/32916
Int. Cl.[2] H01H *33/64*
U.S. Cl. 200—148 R **5 Claims**



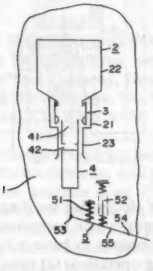
1. A circuit interrupter comprising:
a container filled with a gas for extinction;
a fixed contact in said container;
a movable contact normally connected to said fixed contact;
an insulation nozzle disposed around said contacts, said insulation nozzle including an enlarged portion which forms a unitary coextensive arc chamber and gas chamber; and
means for moving said movable contact to destroy said connection between said fixed and movable contacts,
whereby an arc is formed and the cool gas in said gas chamber easily mixes with and cools the hot gas in said arc chamber so that said arc may be easily extinguished.

4,228,333

CIRCUIT INTERRUPTER HAVING CONTROLLED RATE OF ARC EXTINGUISHMENT

Masami Kii, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,131
Claims priority, application Japan, Jul. 21, 1977, 52/88073
Int. Cl.[2] H01H *33/70*
U.S. Cl. 200—148 R **5 Claims**



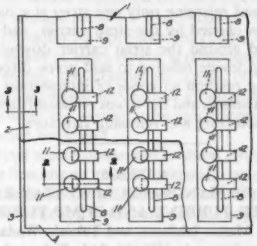
1. In a circuit interrupter comprising a pair of detachable contacts, and means for puffing the arc between the contacts including an arc extinct chamber filled with a fluid for arc extinction which is pressurized by the arc formed between the contacts when they are disengaged, said pair of detachable contacts being at least one movable contact and at least one fixed contact; an improvement which comprises control means including a control device for controlling a departing speed of the movable contact after disengagement from said fixed contact in at least two steps and said control means further including at least two springs exerting force against said control device to force the movable contact mounted thereon out of engagement with the fixed contact at an accelerated rate; said at least two springs driving the movable contact until the movable contact is located a specified distance from the fixed contact; one of said at least two springs ceasing to work against said movable contact at this point and causing a reduction in the accelerated rate of disengagement to prevent rapid extension of the arc and thereby prevent excess arc energy from forming in the arc space between the movable contact and the fixed contact and to prevent the fluid from reaching an elevated temperature; the other of said at least two springs continuing the opening movement of the movable contact out of said arc extinct chamber at a decelerated rate to thereafter puff the pressurized fluid in the arc extinct chamber which is pressurized by the arc formed between the movable contact and the fixed contact to thereby control arc extinguishment by controlling the departing speed of the movable contact.

4,228,334

DYNAMIC MICROWAVE ENERGY MODERATOR

Clarence O. Clark; Thomas J. Flautt, Jr., and Donald T. Speckman, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 27, 1978, Ser. No. 963,695
Int. Cl.[3] H05B *6/80*
U.S. Cl. 219—10.55 E **14 Claims**



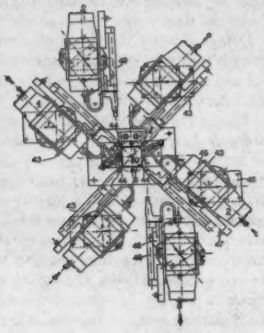
1. A macroscopically dimensionally stable, dynamically temperature responsive microwave energy moderator comprising a sheet-like laminate comprising at least one lamina of microwave energy reflective material with at least one aperture formed therein of such dimensions as to enable the passage therethrough of a substantial portion of impinging microwave energy of a predetermined nominal frequency, said laminate further comprising temperature responsive means for substantially reducing the transmissibility of microwave energy through said aperture without macroscopically reducing the size of said moderator as the temperature of said temperature responsive means is elevated through a predetermined temperature range.

4,228,335

MACHINE FOR PRODUCING REINFORCEMENTS, IN PARTICULAR FOR REINFORCED CONCRETE, AND THE REINFORCEMENTS PRODUCED THEREBY

Bernard Herlin, c/o Standarm, 74, av. du General-de-Gaulle, 72000 Le Mans, France

Filed Sep. 7, 1978, Ser. No. 940,313
Claims priority, application France, Oct. 6, 1977, 77 30083
Int. Cl.³ B23K *11/32, 37/04;* **B21F** *27/10, 15/08*
U.S. Cl. 219—56 **18 Claims**



1. A machine for producing a metal reinforcement for in particular reinforced concrete and comprising a plurality of metal longitudinal members and a plurality of metal straps in the form of frames which may be open or closed and are welded to the longitudinal members, said machine comprising a carrier for receiving and carrying a series of the metal straps, means defining open grooves extending longitudinally on the strap carrier for respectively receiving the metal longitudinal members, shifting means withdrawably engageable with the longitudinal members for advancing the longitudinal members step-by-step in a given direction in the grooves, the grooves having a depth which is such that the longitudinal members project sufficiently from the strap carrier to have a frictional contact with the straps which is sufficient to cause the straps to be driven along with the longitudinal members when the longitudinal members are advanced by the shifting means, structure for selecting and releasing only one strap at a time from said series of straps carried by the strap carrier, and welding devices arranged around the strap carrier downstream of the strap selecting device relative to said given direction and located in facing relation to zones of intersection between the longitudinal members and the straps released from the series of straps by the selecting and releasing structure.

4,228,336

METHOD OF MANUFACTURING STAY RING FOR WATER TURBINE AND PUMP TURBINE

Tetsuo Okuni; Masao Ishihara, and Takeshi Wada, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,081
Claims priority, application Japan, Jun. 7, 1977, 52-66243
Int. Cl.³ B23K *25/00*
U.S. Cl. 219—73.1 **9 Claims**

1. A method of manufacturing a stay ring for use in a water turbine and a pump turbine, the stay ring having an upper annular disc and a lower annular disc and a plurality of circumferentially spaced stay vanes each extending between the upper and the lower annular discs, comprising the steps of:

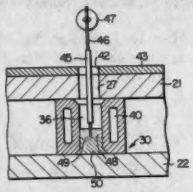
providing upper and lower annular discs;

forming openings in at least the upper annular disc of said upper and lower annular discs at each of the uniformly peripherally spaced locations where said stay vanes are to be positioned;

locating said upper and lower annular discs in a spaced parallel relation to each other with a fixed distance therebetween;

placing a plurality of molds, each having therein a space of a shape conforming to the shape of said stay vane, at fixed positions between said upper and lower annular discs, such that said spaces in the molds are put into communication with corresponding ones of said openings in said upper annular disc;

thereafter effecting an electroslag welding in each of said spaces in the molds by passing a consumable electrode through associated openings in said upper annular disc and into corresponding mold spaces to first bond electroslag molten metal material to said lower annular disc, to



second fill said space in the mold with electroslag molten metal material, and third to bond the electroslag molten metal material to said upper annular disc and at least fill a portion of a space defined by the associated opening in said upper annular disc with electroslag molten metal;

thereafter cooling and solidifying said electroslag deposited molten metal filling said spaces in the molds to form said stay vanes and, at the same time, to permanently and rigidly connect said upper and lower annular discs through the thus formed stay vanes; and

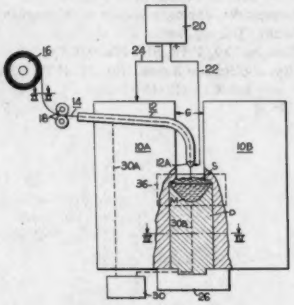
thereafter removing said molds from said stay vanes respectively by disassembling each mold into a plurality of pieces.

4,228,337

METHOD OF ELECTROSLAG WELDING

Robert A. Caldwell, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 914,360, Jun. 12, 1978. This application May 3, 1979, Ser. No. 35,611
Int. Cl.³ B23K *9/18*
U.S. Cl. 219—73.1 **4 Claims**



1. The method of electroslag welding steel members of the ASTM A516-76 family which comprises the steps of (1) positioning said steel members to have a joint gap therebetween prior to the welding operation, (2) using in association with a welding flux a welding electrode having the following alloying constituents by percent weight of the weight of the total electrode:

About 1.90% to about 2.10% manganese
About 0.30% to about 0.45% silicon
About 0.5% to about 1.5% nickel,

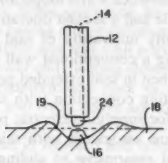
and in which the weight of the carbon content of said welding electrode does not exceed about 0.05% of the total weight of said electrode, and in which substantially the entire balance of the weight of said electrode is iron; (3) applying a direct current voltage between said electrode and said steel members whereby to cause said electrode and a portion of said steel members contiguous said joint gap to melt to form a puddle of molten metal, with a puddle of molten slag formed by said welding flux being superposed above said puddle of molten metal, with the joint gap between said steel members and the applied direct current voltage between said electrode and said steel members being parameters which may be controlled to control the percentage dilution of the electroslag weld deposit; and (4) correlating the values of said parameters to obtain a dilution of said electroslag weld deposit in the range of about 20% to about 50%.

4,228,338

PROCESS FOR IMPLANTING RADIOACTIVE METAL ON A SUBSTRATE

Nathan H. Cook, Cambridge, Mass., and Krishnamoorthy Subramanian, Inkster, Mich., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 8, 1978, Ser. No. 913,763
Int. Cl.[2] B23K *9/04*
U.S. Cl. 219—76.13 **4 Claims**



1. The process for implanting a metal in a desired amount on the surface of a metal substrate subject to wear during use which comprises contacting to said substrate a wire comprising a metal core surrounded by a sheath of a conductive metal, said sheath of conductive metal having a thickness between about 0.0001 and 0.002 inch and a conductivity greater than that of said core, applying an electrical voltage across said wire and substrate to generate an electrical discharge in order to (a) form a pit on said substrate, (b) to weld the wire in said pit and (c) to evaporate a small portion of the conductive sheath adjacent said pit thereby to leave a portion of said core uncoated, and generating a second discharge through said wire in order to sever only a portion of the uncoated core adjacent said substrate.

4,228,339

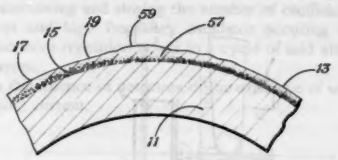
METHOD OF HARDFACING TOOL JOINTS

Stanley R. Scales, and Eric C. Sullivan, both of Houston, Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Dec. 28, 1978, Ser. No. 974,168
Int. Cl.[3] B23K *9/04*
U.S. Cl. 219—77 **4 Claims**

1. An improved method for applying annular bands of hardfacing on a tool joint for earth boring drill pipe, the hard facing having tungsten carbide granules in an alloy steel matrix, the method including the steps of rotating the tool joint, providing an arc between an electrode and the tool joint to create a weld puddle, reciprocating the electrode parallel to the tool joint axis, and feeding the granules by gravity into the weld puddle, the improvement comprising:

stopping the flow of granules into the puddle just before the tie-in at the end of each hardfacing band, but continuing the arc and tool joint rotation a selected distance to provide an overlapped protuberance at the tie-in that is substantially free of granules at the surface, allowing the protuberance to be easily ground.

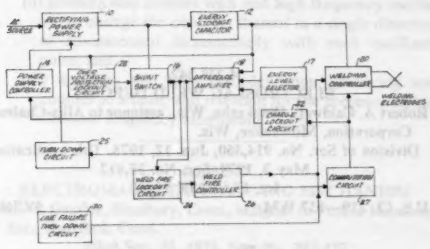


4,228,340

VOLTAGE REGULATED CAPACITIVE DISCHARGE WELDING POWER SUPPLY

Gerald Dufrenne, La Verne, Calif., assignor to Unitek Corporation, Monrovia, Calif.

Filed Apr. 27, 1978, Ser. No. 900,666
Int. Cl.[2] B23K *11/26*
U.S. Cl. 219—113 **14 Claims**



1. A highly regulated welding energy power supply comprising:

a welding energy storage capacitor;

a first circuit means connected in series circuit relationship with the storage capacitor for initiating charging of the storage capacitor to a pre-selected energy level;

switching means in series circuit arrangement with the first circuit means, the conduction angle of the switching means being phased forward as a function of the difference between the storage capacitor energy level and the pre-selected level; and

second circuit means connected in shunt circuit relationship with the first circuit means for terminating charging of the storage capacitor when the pre-selected level is reached thereby preventing overcharge of the capacitor.

4,228,341

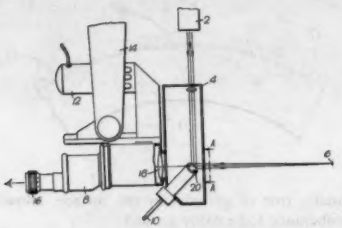
MECHANICAL CONTROL SYSTEM PARTICULARLY USEFUL FOR DIRECTING A LASER BEAM

Yoel Zandberg, Givataim, Israel, assignor to Laser Industries Ltd., Tel Aviv, Israel

Filed Dec. 12, 1978, Ser. No. 968,632
Int. Cl.[3] B23K *27/00*
U.S. Cl. 219—121 L **11 Claims**

1. A mechanical control system for moving a controlled device in response to the movement of a universally movable control member, comprising: a first ball mounted for universal movement in a first socket; a second ball mounted for universal movement in a second socket, and having one side facing one side of the first ball; the control member being coupled to the opposite side of the first ball; the controlled device being

coupled to the opposite side of the second ball; and a connecting stem having a third ball at one end received in a third



socket formed in said one side of the first ball, the opposite end of the stem being fixed to said one side of the second ball.

4,228,342

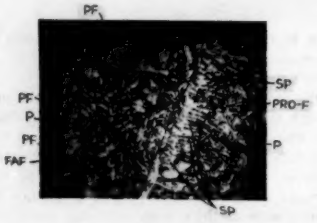
ELECTROSLAG WELD DEPOSIT

Robert A. Caldwell, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 914,360, Jun. 12, 1978. This application May 3, 1979, Ser. No. 35,612

Int. Cl.[3] **B23K** *35/30*

U.S. Cl. 219—137 WM **6 Claims**



1. An electroslag weld deposit made between steel members which have a chemistry substantially as defined for steel of the ASTM A516-76 family, and using a consumable welding electrode having the following alloying constituents by percent weight of the total electrode:

About 1.90% to about 2.10% manganese

About 0.30% to about 0.45% silicon

About 0.9% to about 1.0% nickel,

and in which the weight of the carbon content of said electrode does not exceed about 0.05% of the total electrode weight, and in which substantially the entire balance of the weight of said electrode is iron, and in which said weld deposit has the following constituents by percent weight of the total weight of the weld deposit:

Carbon: about 0.06% to about 0.15%

Manganese: about 1.47% to about 1.80%

Nickel: about 0.49% to about 0.83%

Silicon: about 0.17% to about 0.20%

with substantially the entire balance of the weight of said weld deposit being iron.

4,228,343

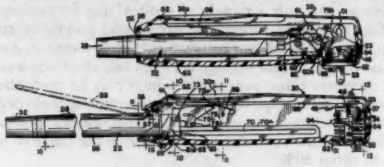
COLLAPSIBLE CORDLESS ELECTRIC HAIR CURLING APPLIANCE

Gary L. Kanner, Lebanon; Samuel H. Kohler, Lancaster, and Robert E. Lewis, Peach Bottom, all of Pa., assignors to Schick Incorporated, Westport, Conn.

Filed Dec. 29, 1977, Ser. No. 865,363

Int. Cl.[2] **A45D** *1/04;* **H05B** *3/06;* **H01R** *11/02*

U.S. Cl. 219—225 **23 Claims**



1. A hair curling appliance comprising in combination:

a hollow handle adapted to be conveniently grasped by the hand of a user;

an electrically heated curling wand including a heat retaining working portion therein, said wand being slidably mounted in said hollow portion of said handle for user operated movement between an exposed use position outwardly of said handle and an enclosed heating position inwardly of said handle thereof;

electric connection means movably mounted in said handle and movable between a first inoperative position retracted into said handle and a second operative position extended at least partially outwardly of said handle for conductively engaging a conventional wall socket, said connection means, when in said extended position, being in conductive operating connection with said working portion of said wand for supplying electric power thereto; and

cooperative means associated with said connection means and wand and responsive to sliding movement of said wand in said handle for moving said electrical connection means to said extended position only when said wand is substantially inserted into said handle in said heating position.

4,228,344

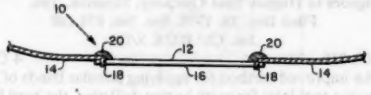
METHOD FOR PROVIDING ELECTRICAL CONNECTION

Charles J. Boos, Lewiston; Elwood B. Hausler, Grand Island; James A. Hirsch, Niagara Falls; Martin R. Kasprzyk, Buffalo, and Elmer G. Smith, Niagara Falls, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Division of Ser. No. 666,297, Mar. 12, 1976, Pat. No. 4,120,827. This application Jun. 29, 1978, Ser. No. 920,427

Int. Cl.[2] **F23Q** *7/22*

U.S. Cl. 219—270 **7 Claims**



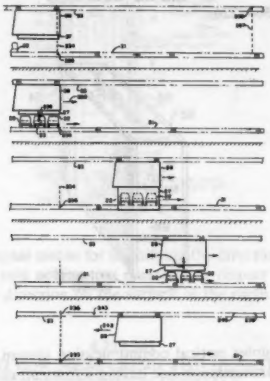
1. A method for providing an electrical connection to a silicon carbide body comprising contacting the body with a conductor consisting essentially of a metal selected from the group consisting of tungsten, tantalum, molybdenum and niobium and melting silicon to both the conductor and the silicon carbide body.

4,228,345

TRAVELING INFRARED BELL OVEN SYSTEM

Jesse C. Stricker, Fenton, and Dennis L. Wagner, Ballwin, both of Mo., assignors to Black Body Corporation, St. Louis, Mo.

Filed Dec. 28, 1978, Ser. No. 973,894
Int. Cl.[2] F27D *11/03*
U.S. Cl. 219—388 32 Claims



1. An oven system adapted for synchronous use with an extrinsic conveyor, said system providing automatic heating of objects successively being conveyed by said conveyor and comprising an oven having means defining a housing including side wall portions, front and rear wall portions, a top wall, and being open at the lower end, heating elements within said oven associated with predetermined ones of said wall portions, means for carrying said oven above an extrinsic conveyor for vertical movement with respect to said conveyor and for horizontal movement in forward and reverse directions along a reach of said conveyor, vertical drive means for vertically moving said oven up and down between an upper position within the lower end of said oven above objects of said conveyor and a lower position with said oven at least partially enclosing said objects on said conveyor for heating thereof by said heating elements, horizontal drive means for horizontally moving said oven in said forward and reverse directions, and control means for causing said horizontal drive means to move said oven forward in synchronism with movement of said objects upon said conveyor while causing said vertical drive means to move said oven to said lower position for heating of said objects and thereafter to move said oven to said upper position, and subsequently causing said horizontal drive means to move said oven in said reverse direction to return said oven for heating of further items upon said conveyor.

4,228,346

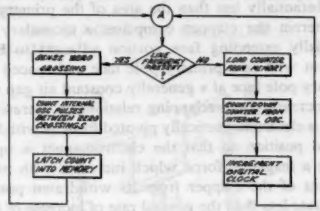
SELF-CALIBRATING ELECTRIC CLOCK CIRCUIT

Charles E. Barker, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 19, 1978, Ser. No. 907,550
Int. Cl.[3] G06M *3/12*
U.S. Cl. 235—92 T 7 Claims

1. A method of self calibrating an electric clock circuit operated by a power source providing constant frequency alternating current and employing a direct current backup electrical power source, a high frequency oscillator for generating timing pulses of greater frequency than said alternating current, a time recorder for registering elapsed time, and by updating said time recorder with the elapse of cyclical periods of said alternating current comprising defining the duration of the periods of said constant frequency alternating current source in terms of a number of pulse counts from said high frequency oscillator by:

(a) repetitively testing for the existence of said constant frequency alternating current,
and upon detecting the presence of said alternating current,
(b) ascertaining and storing the number of oscillator pulses from said high frequency oscillator occuring between successive repetition points in a cycle of said alternating current,
(c) in the absence of detection of the existence of said alternating current,



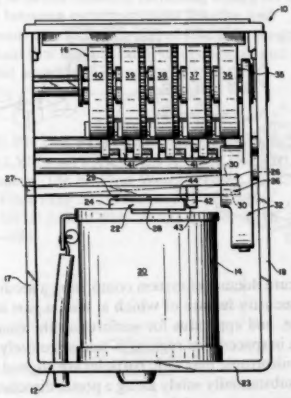
(i) loading said counter with said number of oscillator pulses that occurred between said successive repetition points,
(ii) strobing said counter with said high frequency oscillator to change the contents thereof in a single direction of advancement incrementally with each oscillator pulse, and
(iii) updating said time recorder upon advancing said counter to a limit, and retesting for the presence of said constant frequency alternating current.

4,228,347

ELECTROMAGNETIC COUNTING MECHANISM

John G. Gamble, Simsbury, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Sep. 25, 1978, Ser. No. 945,422
Int. Cl.[3] G06M *1/10*
U.S. Cl. 235—92 C 6 Claims



1. In an electromagnetic counting device having a rotary counter and an electromagnetic operator adapted for indexing the counter comprising an electromagnet with a ferromagnetic core having a primary pole face, a ferromagnetic clapper pivotally mounted in operative magnetic association with the core having a primary face portion in direct tangential alignment with said primary pole face to be directly magnetically attracted thereby when the electromagnet is energized and

adapted to be magnetically pivotally actuated in one pivotal direction from a withdrawn position to an extended position by energization of the electromagnet, spring means biasing the clapper in the opposite pivotal direction to its withdrawn pivotal position with an angular bias which increases with the pivotal displacement of the clapper therefrom and indexing means operable by the clapper for indexing the counter in stepwise fashion upon pivotal movement of the clapper, the improvement wherein the electromagnet core comprises a secondary generally tangentially extending pole face having an area substantially less than the area of the primary pole face and wherein the clapper comprises a secondary generally tangentially extending face portion adjacent to but out of alignment with said primary pole face and spaced from said secondary pole face at a generally constant air gap therewith, but in increasingly overlapping relationship therewith, as the clapper is electromagnetically pivoted from its withdrawn to it extended position so that the electromagnet is operable to produce a magnetic force which increases with pivotal displacement of the clapper from its withdrawn position at a general rate less than the general rate of increase of the spring bias in the opposite direction and whereby the clapper is adapted to be pivotally actuated in accordance with the instantaneous current of the electromagnet.

4,228,348

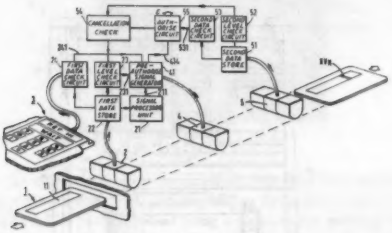
SECURITY DOCUMENT AND SYSTEM

Cyril A. Lee, Littlewick Green, England, assignor to E M I Limited, Hayes, United Kingdom

Continuation-in-part of Ser. No. 859,236, Dec. 9, 1977. This application May 31, 1979, Ser. No. 44,223

Int. Cl.[3] G06K *7/08, 19/06;* **G11B** *25/04, 5/02*

U.S. Cl. 235—449 **10 Claims**



1. A secure document system comprising a secure document having a security feature of which at least a part is selectively cancellable, and apparatus for performing the cancellation,

wherein in spaced first regions of said selectively cancellable part anisotropic magnetic particles are aligned and magnetised substantially solely along a preset direction and in the remaining regions of the part the particles are either not so aligned or are aligned and magnetised substantially solely along a different preset direction, and said apparatus comprises means for reading at least said part and means for cancelling a selected area, which cancelling means applies a uniaxial magnetic field to said area of such a strength and direction that the difference in remanence between said first regions and said remaining regions is significantly reduced.

4,228,349

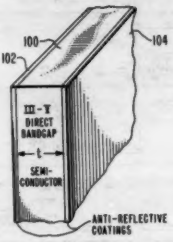
III-V DIRECT-BANDGAP SEMICONDUCTOR OPTICAL FILTER

Michael Ettenberg, Freehold, and Charles J. Nuese, North Brunswick, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,566

Int. Cl.[3] G01J *3/34*

U.S. Cl. 250—226 **5 Claims**



1. In a duplex optical communication system comprising a fiber-optic transmission line having a first end thereof at a first terminal and a second end thereof at a second terminal and extending between said first and second terminals, first source means at said first terminal for applying relatively long-wavelength optical wave energy to said transmission line, second source means at said second terminal for applying relatively short-wavelength optical wave energy to said transmission line, first filter and detector means in cooperative spaced relationship with said first end of said transmission line at said first terminal for detecting substantially solely said relatively short-wavelength optical wave energy, and second filter and detector means in cooperative spaced relationship with said second end of said transmission line at said second terminal for detecting substantially solely said relatively long-wavelength optical wave energy; the improvement wherein:

said second filter and detector means comprises a III-V direct bandgap semiconductor optical filter in the path of the optical wavelength energizing from said second end of said transmission line and an optical detector for detecting the optical wave energy which passes through said III-V direct bandgap semiconductor optical filter, said direct bandgap corresponding to an energy-level difference proportional to a preselected optical wavelength which is intermediate said relatively long-wavelength of optical wave energy from said first source means and said relatively short wavelength of optical wave energy from said second source means.

4,228,350

METHOD AND APPARATUS FOR MEASURING UNDERGROUND FLUID FLOW CHARACTERISTICS

Hans J. Paap; Albert P. Richter, Jr.; Harold E. Peelman; Dan M. Arnold, and Hubert D. Scott, all of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,357

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—267 **23 Claims**

1. Well logging apparatus comprising:

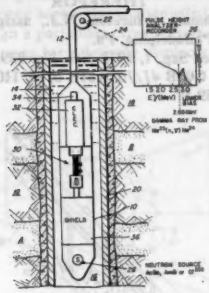
(a) a sonde adapted for passage through a well borehole;

(b) a neutron source with said sonde;

(c) a gamma ray detector within said sonde longitudinally displaced from said neutron source;

(d) collimating means for selectively circumscribing said detector to limit detection sensitivity to radiation passing to said detector through said collimating means, and selec-

tively rotatable to vary the rotational orientation of said collimating means relative to said detector; and



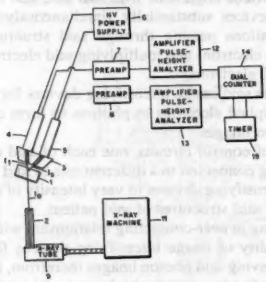
(e) gyrocompass means for identifying the direction of orientation of said collimating means with respect to a fixed reference direction on the surface of the earth.

4,228,351

METHOD FOR MEASURING THE DENSITY OF LIGHTWEIGHT MATERIALS

Samuel G. Snow, Oak Ridge, and Edward J. Giacomelli, Knoxville, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 26, 1979, Ser. No. 15,259
Int. Cl.[2] G01N *23/20*; G21K *1/00*
U.S. Cl. 250—273 **2 Claims**



1. A method for determining the density of lightweight materials having low atomic numbers including plastics and carbon composites comprising the steps of:

directing a collimated beam of X-radiation onto a sample of lightweight material at a fixed oblique angle of incidence such that the scattered X-ray path length is equal to the transmitted X-ray path length within said sample;

simultaneously measuring the X rays transmitted and scattered by said sample with a first detector for measuring the transmitted radiation positioned in alignment with said beam of X radiation on that side of said sample opposite the origin of said beam and with a second detector for measuring scattered radiation positioned at an acute angle with respect to the first detector on that side of said sample opposite the origin of the radiation beam;

determining the ratio of the radiation scattered to the radiation transmitted; and

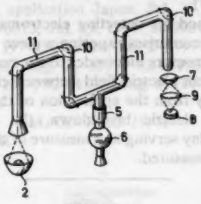
comparing said ratio with ratio values determined from corresponding measurements of standards having known densities that were prepared from similar material for determining the density of said sample material independent of the thickness thereof.

4,228,352

APPARATUS FOR MEASURING THE CONCENTRATION OF GASES

Werner Adrian, Im Roth 19, D-7505 Ettlingen-Oberweier, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,718
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1978, 2805972
Int. Cl.[3] G01J *1/00*; G01N *21/00*
U.S. Cl. 250—343 **6 Claims**



1. Apparatus for measuring the concentration of gases by radiation absorption comprising:

a source of infra red radiation;

a detector of infra red radiation;

a plurality of straight tube lengths each having fluid impervious side walls the inner surfaces of which are highly reflective of infra red radiation, a first end of a first of said tube lengths being located adjacent said source to receive infra red radiation therefrom, a first end of a second of said tube lengths being located adjacent said detector to direct infra red radiation thereto;

a plurality of connectors connecting the remaining ones of said plurality of tube lengths in sequence between the second end of said first tube length and the second end of said second tube length, each tube length being in angled relation to the adjacent tube lengths and each connector including infra red radiation reflecting means for directing radiation between successive tube lengths; and

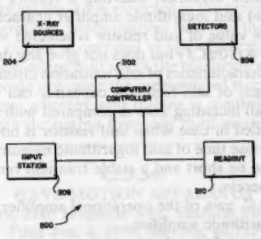
gas inlet means connected to one of said tube lengths intermediate said first end of said first tube length and said first end of said second tube length.

4,228,353

MULTIPLE-PHASE FLOWMETER AND MATERIALS ANALYSIS APPARATUS AND METHOD

Steven A. Johnson, 136 N. First West, Preston, Id. 83772

Filed May 2, 1978, Ser. No. 902,208
Int. Cl.[3] G01F *1/00*; G01N *21/00, 23/20*; G21K *1/00*
U.S. Cl. 250—356 **19 Claims**



1. A non-invasive meter apparatus comprising:

a first radiation source and first radiation detector demountably attachable to a vessel at a first location;

a second radiation source and a second radiation detector demountably attachable to said vessel at a second location;

computing means for comparing radiation signals detected by the first detector with radiation signals received by the second detector; and

control means for selectively controlling the first and second radiation sources and the first and second detectors.

4,228,354

METHOD FOR DETECTING RADIATION

Ari Lehto, Läksyrinne 27-29 E 2, Helsinki 75, and Hannu Harjunmaa, Aallonhuippu 7 B 35, Espoo 32, both of Finland

Filed Jul. 13, 1979, Ser. No. 57,216
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—371 **6 Claims**

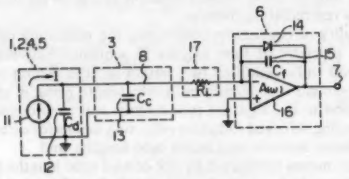
1. In the method for detecting electromagnetic or particle radiation which comprises exposing a piece of semiconductor fitted with two or more electrodes to the radiation to be measured, applying an electric field between electrodes and observing the delay from the application of the electric field to the subsequent electric breakdown, the radiation-induced change in the delay serving as a measure of the intensity of the radiation to be measured.

4,228,355

METHOD FOR SHORTENING RESPONSE TIME OF LOGARITHMIC MEASURING APPARATUS

Naoaki Wakayama, Ibaraki; Toshiyuki Iida, Wakayama, and Hideshi Yamagishi, Mito, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Jan. 18, 1978, Ser. No. 870,530
Claims priority, application Japan, Jan. 19, 1977, 52/3994
Int. Cl.[2] H01J *39/28;* G06G *7/12*
U.S. Cl. 250—374 **1 Claim**



1. In a method for shortening the response time of a logarithmic measuring apparatus which comprises using an ionization chamber sensitive to the nuclear radiation for nuclear radiation to be measured, a signal line connected to said ionization chamber to transmit the output current of said ionization chamber and a logarithmic amplifier having a feedback capacitor and a logarithmic diode in the negative feedback circuit of an operational amplifier of said logarithmic amplifier and connected to said signal line to receive said output current as the input of said logarithmic amplifier; inserting a resistor between said signal line and said logarithmic amplifier characterized in that the resistance value of said resistor is selected within a range that exceeds $A/10\pi C_f f_T$ but does not give any degradation on the plateau characteristics of said ionization chamber, whereby the capacitance of said feedback capacitor can be made substantially small including zero as compared with a capacitance which is needed in case when said resistor is not provided so that the response time of said logarithmic measuring apparatus is rendered to be short and a stable transient response can be obtained; wherein,

A is the D.C. gain of the operational amplifier to be used in said logarithmic amplifier,

C_f is the sum of the electrostatic capacitance C_d between electrodes of said ionization chamber and the electrostatic capacitance C_c to ground of said signal line, and

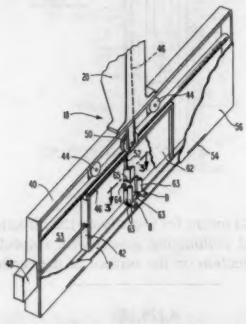
f_T is the unity gain frequency of said operational amplifier.

4,228,356

OPTIMUM CONTRAST PANORAMIC DENTAL RADIOGRAPHY AND METHODS OF PROVIDING THEREFOR

Robert H. Cushman, Princeton, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 1, 1978, Ser. No. 939,646
Int. Cl.[3] G03B *41/16;* A61B *6/14;* H01J *31/50*
U.S. Cl. 250—439 P **8 Claims**



1. An x-ray machine comprising an X-ray source adapted to continuously direct radiation through a slot disposed in a front panel of a film holder assembly containing film controllably movable therewithin for sequentially exposing portions thereof to radiation passing through structures of a patient disposed between said X-ray source and film holder assembly to form a full size panoramic radiograph,

a plurality of identical image intensifying devices disposed in vertical alignment secured within said film holder assembly in operable alignment with said slot, said image intensifying devices substantially simultaneously converting said radiations passing through said structures of said patient to electrons and multiplying said electrons to form multiplied electrons,

means within said image intensifying devices for converting said multiplied electrons to photons to form corresponding photon images,

a plurality of control circuits, one each of said control circuits being connected to a different one of said plurality of image intensifying devices to vary intensity of said photon images of said structures of said patient,

said film being in near-contacting relationship with output of said plurality of image intensifying devices for continuously receiving said photon images therefrom, said photon images having intensities which vary with varying densities of said structures on said full size radiograph.

4,228,357

DETECTOR ON WHEEL SYSTEM (FLYING SPOT)

Martin Annis, Newtonville, Mass., assignor to American Science and Engineering, Inc., Cambridge, Mass.

Filed Dec. 4, 1978, Ser. No. 966,227
Int. Cl.[3] G01N *21/34, 23/04*
U.S. Cl. 250—445 T **35 Claims**

1. A radiant energy imaging apparatus for displaying the characteristic radiation absorption of cross-sectional areas of an irradiated body, comprising:

source means for generating penetrating radiation;

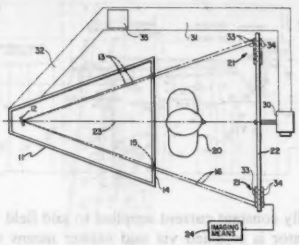
collimating means for interrupting said radiation to pass an arc-shaped fan beam of radiation and to direct said fan beam to pass through a corresponding arc-shaped cross section of said irradiated body;

a plurality of detectors arranged in an arc-shaped curve for receiving the unattenuated radiation transmitted through said arc-shaped cross section of the body and generating

electrical signals corresponding to the intensity of the unattenuated radiation;

means for rotating said detectors to scan each of said detectors at least once across the unattenuated radiation transmitted through a particular cross section of the body;

displacement means for relatively displacing said detectors



and said fan beam along the axis of said body to irradiate and to measure the unattenuated transmitted radiation through successive cross sectional areas of the body; and

display means responsive to said detector electrical signals to display a two dimensional representation of the characteristic radiation absorption of the scanned cross-sectional areas of the body.

4,228,358

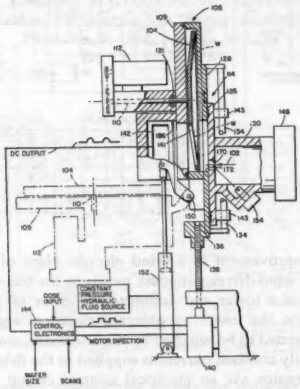
WAFER LOADING APPARATUS FOR BEAM TREATMENT

Geoffrey Ryding, Manchester, Mass., assignor to Nova Associates, Inc., Beverly, Mass.

Filed May 23, 1979, Ser. No. 41,807

Int. Cl.[2] A61K *27/02*; H01J *9/38*

U.S. Cl. 250—457 **20 Claims**



1. Apparatus for exchanging a treated disk for an untreated disk in ion implantation equipment, said implantation equipment being of the type comprising a vacuum chamber in which said disks are subjected to an ion beam and a rotating spindle to which said disks are attached for rotation with respect to said beam, said exchange apparatus comprising:

means for moving said treated disk from said vacuum chamber to a first exchange position,

means for supporting said untreated disk at a second exchange position adjacent said first position,

means for locking said disks to said spindle,

means for engaging and disengaging said locking means, and

means for simultaneously moving said treated disk from said first to said second position and said untreated disk from said second position to said first position.

4,228,359

ROTOR-STRESS PREESTIMATING TURBINE CONTROL SYSTEM

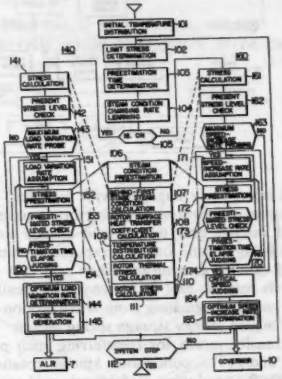
Hiroshi Matsumoto; Yoshio Sato, both of Hitachi; Shigeyoshi Kawano, Hitachiota; Yoshiyuki Nakano, Hitachi; Fumio Kato, Hitachi; Katsukuni Hisano, Hitachi; Katsuto Kashiwahara, Hitachi; Yasuhiko Otawara, Katsuta; Toshihiko Higashi, Hitachi; Yasuhiro Tennichi, Hitachi; Jube Matsumura, Hitachi, and Koichiro Fukushima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 28, 1978, Ser. No. 929,130

Claims priority, application Japan, Jul. 29, 1977, 52-90312; Jul. 29, 1977, 52-90313; Jul. 29, 1977, 52-90314; Jul. 29, 1977, 52-90315; Jul. 29, 1977, 52-90316; Jul. 29, 1977, 52-90317; Aug. 8, 1977, 52-94192; Aug. 8, 1977, 52-94195; Aug. 8, 1977, 52-94196; Aug. 8, 1977, 52-94198; Aug. 8, 1977, 52-94199; Aug. 10, 1977, 52-95176

Int. Cl.[3] F01D *19/02*

U.S. Cl. 290—40 R **29 Claims**



1. A rotor-stress preestimating turbine control system adapted for use in a power generating plant having a source of a working fluid, a valve for regulating the flow rate of the working fluid generated by said source, a turbine adapted to be driven by said working fluid and an alternator mechanically connected to said turbine, said control system being adapted to calculate the stress caused in said turbine due to a change of the condition of said working fluid and to control the operation of said turbine in accordance with the calculated stress,

said control system being characterized by comprising: a first means for setting a plurality of changing rates of the running condition of said turbine; a second means adapted to preestimate the stress expected in the turbine rotor over a predetermined preestimation time on the assumption that said turbine is operated at said changing rates; and a third means adapted to select the maximum changing rate which would not cause the preestimated stress to exceed a limit stress; whereby said turbine is controlled in accordance with the output from said third means.

4,228,360

WAVE MOTION APPARATUS

Pablo Navarro, 2110 Magnolia Ave., Sanford, Fla. 32771

Filed Jun. 8, 1979, Ser. No. 46,713

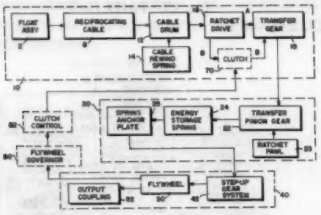
Int. Cl.[3] F03B *13/12*

U.S. Cl. 290—43 **9 Claims**

1. Apparatus for producing useful work from wave motion in a body of water comprising:

first transfer means for periodically transferring the energy in such wave motion to translational mechanical energy, said first transfer means comprising a cable and float means adapted to be anchored in the body of water, said float means connected to said cable for converting the wave motion into a reciprocating translational motion of said cable;

storage means for periodically storing such translational mechanical energy as potential torsional energy, said storage means comprising cable drum means connected to said cable for coiling and uncoiling said cable on said drum, said drum arranged to rotate in a forward direction in response to uncoiling of said cable when said translational motion is away from said drum means, said drum means having a recoil spring arranged to rotate said drum in a reverse direction to rewind said cable on said drum means when said translational motion is toward said drum means, first ratchet gear means connected to said cable drum means and adapted to rotate only when said cable drum is rotated in a forward direction, second ratchet gear



means operatively engaged with said first ratchet gear means, and energy storage spring means connected to said second ratchet gear means, said energy storage spring means being wound only in response to rotation of said second ratchet gear means when said first ratchet gear means is rotated, and to thereby periodically store torsional energy originating from wave motion of said float means in said energy storage spring means;

second transfer means for transferring such potential torsional energy to continuous kinetic rotational energy available for producing useful work, said second transfer means comprising a shaft connected to said energy storage spring means and adapted to be rotated as said energy storage spring means unwinds, and an energy storage flywheel driven from said shaft for receiving the stored torsional energy from said energy storage spring means, said energy storage flywheel adapted to provide a continuous energy output; and

means for producing useful work from such kinetic rotation energy.

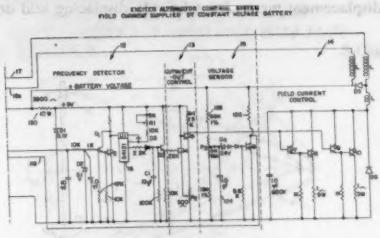
4,228,361

WIND ELECTRIC PLANT WITH IMPROVED ALTERNATOR FIELD EXCITATION

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rte. 13 - Box 722, Ft. Myers, Fla. 33908

Filed Mar. 16, 1978, Ser. No. 887,373
Int. Cl.[3] H02P 9/04
U.S. Cl. 290—44 **18 Claims**

1. In a wind electric plant of the type including a wind driven propeller or the like supported at the top of a tower and connected to drive an alternator supported on the tower to generate electrical energy, and storage battery means connected to be charged by the alternator, electrical control circuit means connecting the storage battery means with the field winding of the alternator to supply a substantially constant current to the field winding at substantially all speeds of operation of the wind electric plant within a predetermined range of speeds to excite the field of the alternator and thus obtain full excitation of the alternator field at substantially all speeds of operation of the wind electric plant within said range, the improvement comprising: exciter means connected with said electrical control circuit means connecting the storage battery means with said field winding of the alternator, wherein the



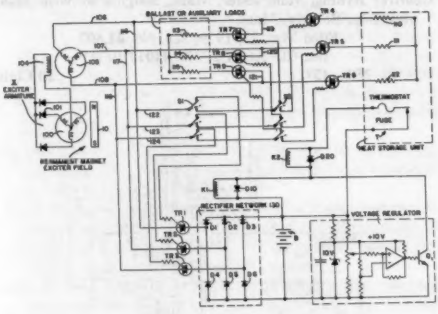
substantially constant current supplied to said field winding of the alternator is supplied via said exciter means so that the alternator field can be fully energized at slow speed and have such field saturation condition maintained over the entire speed range of said alternator.

4,228,362

WIND ELECTRIC PLANT WITH IMPROVED ALTERNATOR FIELD EXCITATION

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rte. 13, Box 722, Fort Myers, Fla. 33908

Filed Jul. 3, 1978, Ser. No. 921,334
Int. Cl.[3] F03D 9/00
U.S. Cl. 290—44 **37 Claims**



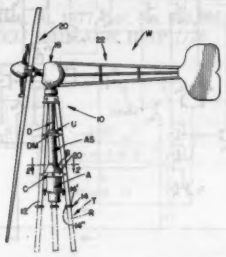
1. An improvement in a wind electric plant of the type including a wind driven propeller means or the like supported at the top of a tower and connected to drive an alternator supported on the tower to generate electrical energy, and means connected to be supplied by the alternator, and wherein a substantially constant current is supplied to the field winding of the alternator via an electrical control circuit means at substantially all speeds of operation of the wind electric plant within a predetermined range of speeds to excite the field of the alternator and thus obtain full excitation of the alternator field at substantially all speeds of operation of the wind electric plant within said range, the improvement comprising: exciter means connected with said alternator, said exciter means including a permanent magnet exciter field wherein the substantially constant current supplied to the field winding of said alternator is supplied via said exciter means so that the alternator field can be fully energized at slow speed and have such field saturation condition maintained over the entire speed range of said alternator, thereby permitting operation of the wind electric plant without the said electrical control circuit means and its source of supply voltage.

4,228,363

MODULAR WIND ELECTRIC POWER PLANT

Marcellus L. Jacobs, and Paul R. Jacobs, both of Rte. 13 - Box 722, Fort Myers, Fla. 33901

Filed Apr. 3, 1979, Ser. No. 26,691
Int. Cl.[3] F03D *11/04*
U.S. Cl. 290—44 10 Claims



1. A method of assembling a wind electric power plant comprising the steps of:

assembling a stub tower section which includes a drive shaft, an alternator, and an alternator armature shaft connected to the drive shaft;

aligning the drive and alternator armature shafts;

testing the assembled stub tower section in a test environment;

moving the assembled stub tower in the assembled condition to an installation site; and

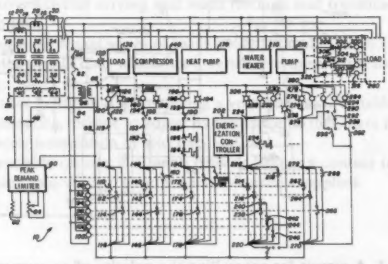
placing the assembled stub tower onto an existing support at the installation site.

4,228,364

ENERGY MANAGEMENT SYSTEM

Jack O. Walden, 789 Georgia Ave., Sunnyvale, Calif. 94086

Filed Jun. 5, 1978, Ser. No. 912,213
Int. Cl.[2] H02J *3/18*
U.S. Cl. 307—38 5 Claims



1. An energy management system for reducing the power consumption of a plurality of normally energized loads comprising:

means providing a source of interrupter actuating voltage;

first timing means having a 168-hour timing cycle;

second timing means having a 24-hour timing cycle;

third timing means having a fractional day timing cycle; and

a plurality of independently acting subcircuits each including

interrupting means capable of interrupting the flow of energy to a particular one of said plurality of loads,

first switching means responsive to said first timing means and operative to apply said actuating voltage to apply said actuating voltage to said interrupting means so as to cause it to interrupt the flow of energy to its corresponding load during a selected period of said 168-hour timing cycle,

second switching means independent of said first switching means but connected in parallel circuit therewith and responsive to said second timing means and operative to apply said actuating voltage to said interrupting means so as to cause it to interrupt the flow of energy to said corresponding load during a selected period of said 24-hour cycle, and

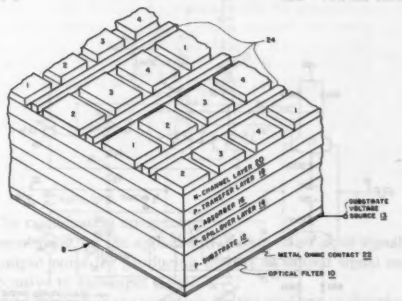
third switching means independent of said first and second switching means but connected in parallel circuit therewith and responsive to said third timing means and operative to apply said actuating voltage to said interrupting means so as to cause it to interrupt the flow of energy to said corresponding load during a selected portion of the fractional day timing cycle.

4,228,365

MONOLITHIC INFRARED FOCAL PLANE CHARGE COUPLED DEVICE IMAGER

William A. Gutierrez, Woodbridge, and John H. Pollard, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1978, Ser. No. 948,129
Int. Cl.[3] G11C *19/28*; H01L *29/78, 27/14, 29/56*
U.S. Cl. 307—221 D 15 Claims



1. A monolithic intrinsic infrared (IR) focal plane array charge coupled device (CCD) imager for imaging a non-scanned IR scene image, said imager comprising:

a monolithic intrinsic substrate chip having photon detection and electron charge signal producing means on one layer thereof and CCD electrical multiplexer video output producing means for said charge signal on a separate CCD channel layer thereof wherein said one layer is comprised of a wide band spillover layer and a narrow band absorber layer,

a heterostructure injection means for isolating said signal charge during non-read time to prevent premature filling of CCD channel wells and for transporting said signal charge during read time to said CCD channel wells by a punch through condition, said heterostructure injection means comprising a heterojunction barrier formed between said absorber layer and a transfer layer of said monolithic intrinsic substrate wherein said absorber layer and said transfer layer provide lattice matching with proper bandgap, thicknesses, and doping types and levels for efficient injection across said heterojunction barrier, and

charge signal time sampling means operating in a pulse gated mode of operation and comprised of a substrate punch through voltage applied to said substrate during a selected integration time corresponding to the composition of said absorber layer that is spectrally tuned for operation in a

selected spectral region and is further comprised of adjacent rows of Schottky barrier gates that are phase switched by a four phase switching system wherein each Schottky barrier gate that is activated is surrounded on all four sides by inactivated gates to electrically isolate alternate areas and each row of the Schottky barrier gates to prevent blooming into adjacent rows to screen out the previously punched through charge signals wherein said substrate punch through voltage is further timed to punch through the isolated charge signals that are continuously stored in said absorber layer at such a rate that said CCD channel wells are never completely filled wherein said Schottky barrier gates directly overlay said CCD channel layer and are phase switched to sweep out the previously punched through charge signals before a subsequent charge signal is punched through wherein said CCD electrical multiplexer video output producing means produces a video output therefrom in accordance with said IR scene image.

4,228,366

INTEGRATOR CIRCUIT WITH LIMITER

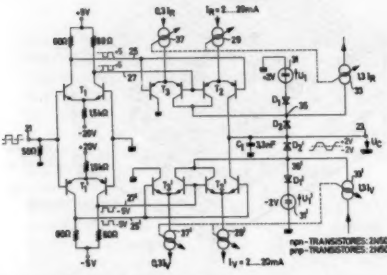
Werner Hüttemann, Herrenberg-Kuppingen, and Reinhard Falke, Altdorf, both of Fed. Rep. of Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 21, 1978, Ser. No. 926,788

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737432

Int. Cl.³ H03K *5/08;* **G06G** *7/184*

U.S. Cl. 307—229 **2 Claims**



1. An integrator circuit comprising:

a capacitor;

source means of current for charging and discharging the capacitor;

means connecting and disconnecting the source means and the capacitor;

limiter means including diodes connected to limit the capacitor voltage to a predetermined value; and

control means for simultaneously disconnecting the limiter means from the capacitor and connecting thereto the source means for charging the capacitor.

4,228,367

HIGH SPEED INTEGRATED SWITCHING CIRCUIT FOR ANALOG SIGNALS

Paul M. Jr. Brown, Morgan Hill, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Aug. 7, 1978, Ser. No. 931,672

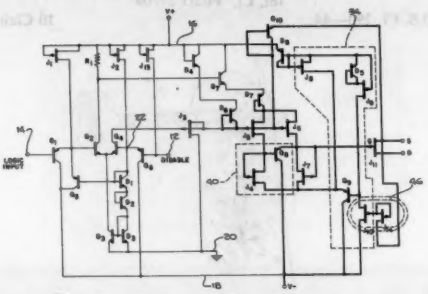
Int. Cl.³ H03K *17/687*

U.S. Cl. 307—251 **9 Claims**

1. A high current switching circuit comprising:

a switch Junction Field Effect Transistor, or JFET, having a high current capacity;

means for switching said switch JFET off rapidly and holding the gate electrode more than a "pinch-off" voltage beyond the normal source electrode voltage; said switching means including second JFET means of intermediate size for charging the gate capacitance of said switch JFET, and third JFET means of relatively small size in series with said second JFET means for limiting current



flow after the gate capacitance of said switch JFET is charged while said switch JFET is off and for holding said switch JFET gate voltage more than a "pinch-off" beyond the normal source voltage.

4,228,368

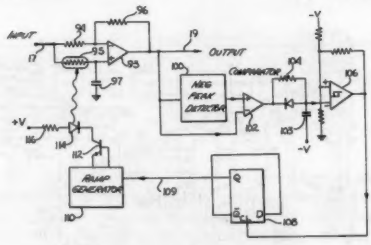
POLARITY CORRECTING CIRCUIT

Robert A. Orban, 2413 Lincoln Ave., Belmont, Calif. 94002

Division of Ser. No. 858,720, Dec. 8, 1977, abandoned. This application Oct. 26, 1978, Ser. No. 954,927

Int. Cl.³ H03L *7/00*

U.S. Cl. 307—262 **7 Claims**



1. A circuit for controlling the polarity of an asymmetrical input audio signal comprising:

a switching means for selectively providing an inverted or non-inverted audio output signal, the input of said switching means coupled to receive said input audio signal, said switching means providing a transition to said inverted or non-inverted output audio signal such that each frequency of said audio signal is changed to an inverted or non-inverted state at a different time;

detection means for sensing said polarity;

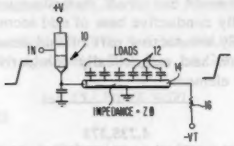
control means for controlling said switching means, said control means coupled to said detection means and said switching means;

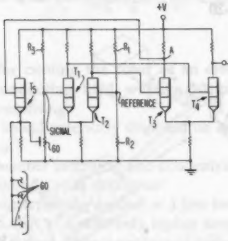
whereby smooth polarity switching is provided for said audio signal.

4,228,369
INTEGRATED CIRCUIT INTERCONNECTION STRUCTURE HAVING PRECISION TERMINATING RESISTORS

Narasipur G. Anantha, Hopewell Junction; Robert A. Henle, Clinton Corners, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,808
Int. Cl.[2] H03K 5/08; H01P 1/26
U.S. Cl. 307—270 11 Claims





1. An integrated circuit interconnection structure comprising:

a driver circuit in an integrated circuit device;

a transmission line having a series of loads connected thereto;

said driver circuit driving said loads through said transmission line;

the last load in said series of loads being located in an integrated circuit chip which has a variable terminating resistor;

means for generating and applying a voltage to said variable terminating resistor to adjust its resistance so that there is precise termination of said line; and

said variable resistor is a pinch resistor having a contact to which said voltage to adjust its resistance is applied.

4,228,370
BISTABLE MULTIVIBRATOR WITH TRIGGER STEERING

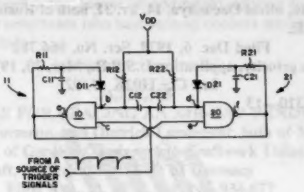
Zachariah H. Milburn, Jr., Amherst, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Sep. 25, 1978, Ser. No. 945,265
Int. Cl.[3] H03K 3/286
U.S. Cl. 307—291 8 Claims

1. A triggerable multivibrator comprising:

first and second multiple-input logic gates, each having a clamped input and an unclamped input wherein the output of the first logic gate is connected to the unclamped input of the second logic gate and the output of the second logic gate is connected to the unclamped input of the first logic gate,

a first clamping network connected between the output and the clamped input of the first logic gate, and

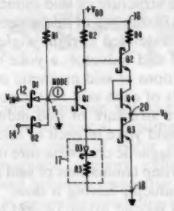


a second clamping network connected between the output and the clamped input of the second logic gate.

4,228,371
LOGIC CIRCUIT

James D. Mazgy, Parsippany, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,759
Int. Cl.[2] H03K 17/00
U.S. Cl. 307—317 A 5 Claims



1. The combination comprising:

an input point for the application thereto of an input signal;

an output point for producing thereat an output signal responsive to said input signal;

first and second power terminals for the application therebetween of an operating potential;

first and second transistors, each transistor having a base, an emitter and a collector;

means connected between said input point and the base of said first transistor for coupling the input signal to the base of said first transistor;

means connecting the collector of said first transistor to said first power terminal;

means connecting the base of said second transistor to the emitter of said first transistor, the collector of said second transistor to said output point, and the emitter of said second transistor to said second power terminal;

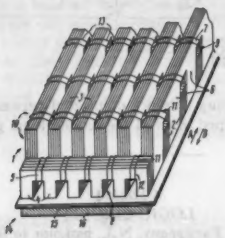
a resistor and a Schottky barrier diode; said diode characterized in that its forward drop is substantially greater than zero volts but less than the base-to-emitter forward drop (V_{BE}) of said second transistor and in that said diode has a larger rectifying area than the area of the base-to-emitter junction of said second transistor; and

negligible impedance means connecting said resistor and said diode in series between the base and emitter of said second transistor; said Schottky barrier diode being poled to conduct current in the same forward direction as the base-to-emitter junction of said second transistor for enabling current flow through the diode prior to the flow of current through the base-to-emitter junction of the second transistor in response to a forward biasing signal applied to the base of said second transistor.

4,228,372
LINEAR INDUCTION MOTOR

Alexandr D. Popov, pereulok Rynochny, 44, and Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31, both of Rostov-na-Donu, U.S.S.R.

Filed Dec. 6, 1978, Ser. No. 966,782
Claims priority, application U.S.S.R., Mar. 20, 1978, 2587755
Int. Cl.[2] H02K 41/02
U.S. Cl. 310—13 1 Claim

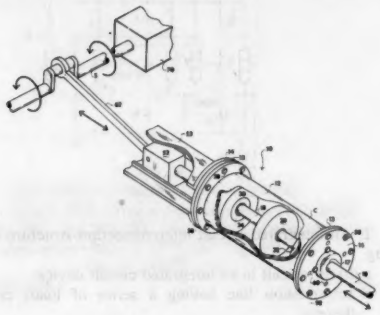


1. A linear induction motor comprising:
an inductor;
a magnetic core structure of said inductor;
laminations of a first group of said magnetic core structure of said inductor extended at right angles to the direction of movement of said inductor; a yoke of each of said first-group laminations of said magnetic core structure of said inductor; rods of each said first-group lamination of said magnetic core structure of said inductor interconnected by means of said yoke of each of said first-group laminations of said magnetic core structure of said inductor; each of said first-group laminations of said magnetic core structure of said inductor having n slots;
laminations of a second group of said magnetic core structure of said inductor extended in the direction of movement of said inductor; a yoke of each said second-group lamition of said magnetic core structure of said inductor; rods of each said second-group lamination of said magnetic core structure of said inductor interconnected by means of said yoke of each of said second-group laminations of said magnetic core structure of said inductor; slots in each said second-group lamination of said magnetic core structure of said inductor;
said first-group laminations of said magnetic core structure of said inductor interconnected by means of said second-group laminations of said magnetic core structure of said inductor;
one of said extreme first-group laminations of said magnetic core structure of said inductor having its rods adjacent all the extreme rods of said second-group laminations of said magnetic core structure of said inductor, arranged in mating relation the said first-mentioned rods;
said rods of the other first-group laminations of said magnetic core structure of said inductor fitting tightly in said slots of said second-group laminations of said magnetic core structure of said inductor so that no gaps exist therebetween and toothless active zones are formed in the direction of movement of said inductor; said yokes of said first-group laminations of said magnetic core structure of said inductor so arranged with respect to said yokes of said second-group laminations of said magnetic core structure of said inductor that appropriate gaps exist therebetween;
a polyphase winding of said inductor;
coils of said polyphase concentrated winding of said inductor arranged in a plurality of rows;
a first group and a second group of said coils of said polyphase concentrated winding of said inductor;
said first-group coils of said polyphase concentrated winding of said inductor arranged on said yoke of each said first-group lamination of said magnetic core structure of said inductor, and equal in number to said slots in each said first-group lamination of said magnetic core structure of said inductor;
said second-group coils comprised in said polyphase concentrated winding of said inductor arranged on said yoke of each said second-group lamination of said magnetic core structure of said inductor and equal in number to said slots in each said second-group lamination of said core structure of said inductor;
a secondary element with respect to which said inductor moves;
a magnetically conductive base of said secondary element;
an electrically conductive part of said secondary element arranged on said magnetically conductive base of said secondary element.

4,228,373
ELECTROMAGNETIC MOTOR

William S. Funderburg, 2103 Pender Ave., Wilmington, N.C. 28403

Continuation-in-part of Ser. No. 857,772, Dec. 5, 1977, Pat. No. 4,179,631. This application Sep. 10, 1979, Ser. No. 74,018
Int. Cl.[3] H02K 7/06
U.S. Cl. 310—20 3 Claims



1. An electromagnetic motor comprising:
(a) a first pair of stationary toroidal-shaped, bifilar wound electromagnetic coils mounted in spaced relationship along an axis extending through the center of each coil, at least one of said coils being designated as a front end coil and having a central opening therein;
(b) an armature means having a drive rod extending therefrom and through said central opening, bearing means aligned with said central opening for supporting said drive rod therein, said armature being thereby mounted for reciprocal movement in said cylinder housing;
(c) said armature means comprising a second electromagnetic coil means attached to said drive rod and movable therewith relative to said first pair of coils, said second coil means being so arranged that its polarity, when activated, is the same as the polarity of the adjacent one of said first pair of coils;
(d) the arrangement and positioning of the magnetic coils and the armature being such that, upon activation of said armature, its path of movement is between said coils only and not within the central opening therein;
(e) a source of direct current and a switching means connecting said source of DC with said first pair of magnetic coils and said second magnetic coil means in such a manner that each of the first pair of coils is alternately activated and during a portion of the time each of said first pair of coils is activated, the second magnetic coil means is activated, whereby as the armature means is attracted to each one of

the first pair of coils it is then repelled by the same one of said first pair as said one coil is closely approached;

(f) a force transmitting means connected to the free end of said drive rod for delivering the force generated by said motor to a mchanism.

4,228,374

ARRANGEMENT FOR COOLING THE ROTOR OF AN ELECTRIC MACHINE, ESPECIALLY A TURBINE TYPE GENERATOR

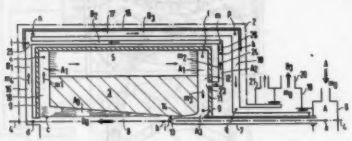
Werner Elsel, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,391

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1977, 2742477

Int. Cl.² H02K *9/00*

U.S. Cl. 310—53 **9 Claims**



1. Apparatus for cooling the rotor of an electric machine having a superconducting field winding longitudinally disposed thereon comprising:

(a) a first cold shield exteriorly disposed on and co-rotating with the rotor;

(b) a mixing chamber interiorly and concentrically disposed on and co-rotating with said rotor;

(c) a coolant unit supplying coolant at a low temperature and receiving coolant at a relatively higher temperature;

(d) means for injecting a phase mixture of said coolant of said coolant unit into said mixing chamber via a coolant injecting line;

(e) a first coolant line for a first coolant stream of liquid coolant derived from said coolant phase mixture;

(f) said first coolant line comprising at least one winding feed line radially disposed at one end of said rotor and in communication with said mixing chamber; further a plurality of winding cooling canals interiorly disposed on said rotor and in heat transfer contact with said superconducting field winding, said winding cooling canals being in communication with said winding feed line; and at least one winding discharge line in communication with said winding cooling canals, radially disposed at the other end of said rotor and in communication with said mixing chamber for conducting at least a part of the first coolant stream into said mixing chamber;

(g) a second coolant line for a second coolant stream having at least partly evaporated coolant derived from said coolant phase mixture;

(h) said second coolant line comprising at least one cold shield feed line radially disposed at one end of said rotor and in communication with the radially inner part of the mixing chamber, further at least one cold shield cooling canal in communication with said cold shield feed line said shield cooling canal axially disposed in heat transfer contact with said cold shield; and at least one cold shield discharge line radially disposed at the other end of said rotor, said cold shield discharge line in communication with the input of said coolant unit and said cold shield cooling canal;

(i) a connecting line in communication with said winding discharge line of the first coolant stream and with the cold shield feed or discharge line of the second coolant stream for admixing a coolant substream derived from said first coolant stream after said first coolant stream has passed through said field winding with said second coolant stream; and

(j) a throttling device incorporated within said connecting line whereby the amont of additional coolant fed of the coolant substream into said second coolant stream can be controlled.

4,228,375

DEVICE FOR BRACING AN AIR-GAP WINDING

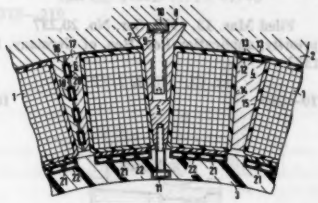
Heinrich Beermann, and Dietrich Lambrecht, both of Mülheim, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 18, 1978, Ser. No. 934,677

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1977, 2737959

Int. Cl.² H02K *3/48*

U.S. Cl. 310—214 **6 Claims**



1. Device for bracing an air-gap winding in a stator of an electric machine wherein individual winding bars are secured between a radially outer stack of stator laminations and a radially inner nonmagnetic support cylinder, comprising spacer wedges disposed between respective pairs of the individual winding bars in circumferential direction, at least some of said spacer wedges being in the form of mounting wedges having dove-tailed extensions received and braced in corresponding recesses formed in the stack of stator laminations at the inner circumference thereof, and the remainder of said spacer wedges being in the form of tightening wedges having tangential prestressing bracing means comprising at least one flexible tube subjectible to internal pressure, and radial prestressing bracing means similarly comprising at least one flexible tube subjectible to internal pressure.

4,228,376

BRUSH DEVICE

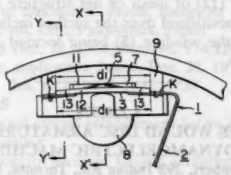
Takaichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Aug. 17, 1978, Ser. No. 934,355

Claims priority, application Japan, Sep. 8, 1977, 52-120900[U]

Int. Cl.² H02K *13/00*

U.S. Cl. 310—242 **3 Claims**



1. A brush device comprising an integrally constructed commutator slide, a brush base and a terminal portion extending from the brush base; the terminal portion and the brush base being adapted to be passed through a terminal insert hole provided on a motor case cover made of synthetic resin, the

motor case cover having at least two projections provided at both side ends of the terminal insert hole and a first support member provided at a substantially central position of the terminal insert hole; the brush device being adapted to be resiliently supported by the first support member and the two projections at the central part and both sides of the brush base, wherein the brush base has a reinforcing piece formed by bending the side of the brush base opposite the terminal portion; and the reinforcing piece extends in the direction of the first support member and the projection and is adapted to be supported at least at the central portion thereof by the first support member.

4,228,377

ROTOR STRUCTURE FOR DYNAMO ELECTRIC MACHINES SUBJECT TO VIBRATORY, SHOCK, OR TEMPERATURE CHANGE EFFECTS

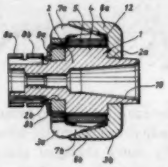
Helmut Kreuzer, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

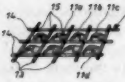
Filed Mar. 13, 1979, Ser. No. 20,237

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1978, 2811323

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—263 **16 Claims**





1. Rotor structure for dynamo electric machines, particularly for such machines subject to oscillatory, vibratory, shock or temperature change effects, comprising

a cylindrical pole core (2, 4);

a plurality of axially located, radially projecting claw pole shoes (3*a*, 3*b*);

and a winding (5) wound on the cylindrical core,

wherein, in accordance with the invention,

at least the portion (4) of the pole core on which the winding is placed is formed with surface deformations in the form of grooves, notches or knurls, and leaving projections (11*a*, 11*b* . . . 11*d*) between the deformations;

and a layer (12) of mesh or net structure insulating fabric material positioned over the surface including said deformations, the winding (5) being located over said fabric layer (12).

4,228,378

WIRE WOUND DISC ARMATURE FOR DYNAMOELECTRIC MACHINE

Marcel E. Humbert, 295 Indian Rd., Toronto, Ontario, Canada (M6R 2X5)

Filed May 21, 1979, Ser. No. 40,485

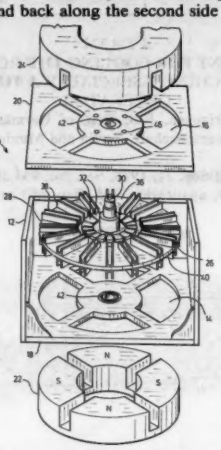
Int. Cl.³ H02K *1/22*

U.S. Cl. 310—268 **6 Claims**

1. An improved disc type armature for a dynamoelectric machine comprising:

(a) a body mounted on a central shaft and commutator means adjacent the shaft, the body being disc shaped with first and second sides and an outer rim; and

(b) a plurality of windings on the disc shaped body, each winding formed of insulated wire extending from the commutator means radially outward along the first side of the body and back along the second side of the body;



wherein the body is formed of a material of relatively high reluctance, and the windings extend through radially extending channels formed of relatively low reluctance material on both sides of the body.

4,228,379

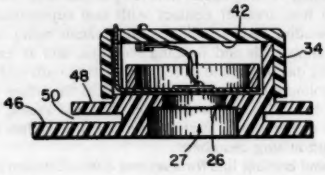
DIAPHRAGM TYPE PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCER

John K. Guscott, Lynnfield; Gerard Renner, Dorchester, both of Mass., and Roger Wendt, Londonderry, N.H., assignors to American District Telegraph Company, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,126

Int. Cl.³ H01L *41/10*

U.S. Cl. 310—322 **21 Claims**



1. An electroacoustic transducer comprising:

a housing having a chamber therein and an aperture;

a vibrating assembly mounted in the chamber of said housing and including:

a metal diaphragm confronting the aperture;

a piezoelectric element engaging one surface of the diaphragm; and

an acoustically-massive clamp ring engaging the periphery of the diaphragm;

first and second electrical terminals connected to said piezoelectric element; and

an acoustic leakage path within the chamber between the back of the diaphragm and the front of the diaphragm and allowing a controlled portion of backward radiation from the back surface of the diaphragm to leak around the

periphery of the vibrating assembly to said aperture at a controlled phase with respect to the forward radiation from the front surface of the diaphragm to modify the directional characteristics of the transducer.

4,228,380

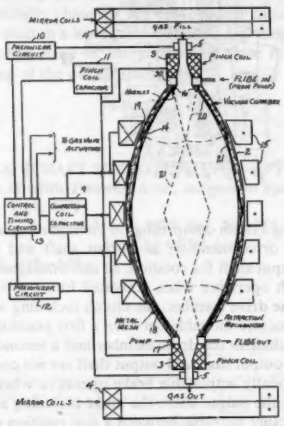
METHOD AND APPARATUS FOR HEATING AND COMPRESSING PLASMA

Daniel R. Wells, Miami, Fla., assignor to Trisops Inc., Austin, Tex.

Continuation-in-part of Ser. No. 954,249, Oct. 24, 1978, abandoned. This application Mar. 16, 1979, Ser. No. 21,206

Int. Cl.[2] G21B *1/00*

U.S. Cl. 315—111.4 **14 Claims**



1. A method of heating and compressing plasma comprising the steps of confining the plasma in a vacuum chamber, generating a containment seed magnetic field in said vacuum chamber, inductively energizing said plasma to generate ring-like plasmoids moving toward collision with each other in the chamber along an axis extending in a direction substantially parallel to said magnetic field, said magnetic field acting to constrain and guide said plasmoids along said axis, and collapsing a molten metal liner on said plasmoids when they have attained collision with each other, so as to amplify said seed magnetic field and heat the plasmoids to thermonuclear temperature.

4,228,381

FLASH TUBE APPARATUS WITH DELAYED EMISSION

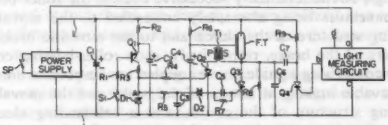
Hiroshi Hasegawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,266

Claims priority, application Japan, Oct. 6, 1977, 52-119422

Int. Cl.[2] H05B *41/32*

U.S. Cl. 315—151 **6 Claims**



1. In flash tube apparatus comprising a drive circuit for ionizing gas in a flash tube by means of a trigger circuit, thereby causing flash discharge in said flash tube, and comprising a light-measuring circuit for measuring the light emitted by said flash tube and reflected by an object to be photographed and for controlling the light emitted by said flash tube, said light-measuring circuit being susceptible to erroneous operation caused by noise generated upon energizing of said trigger circuit, the improvement wherein said drive circuit includes delay means for delaying the flash emission from said flash tube until the lapse of a predetermined delay time commencing with the energizing of said trigger circuit, said delay time being longer than a period during which said light-measuring circuit may be adversely affected by noise generated upon the energizing of said trigger circuit.

4,228,382

POWER REGULATING INVERTER CIRCUIT

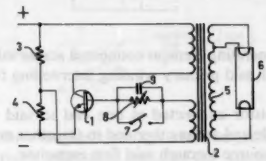
Kalervo M. Virtanen, Lahti, Finland, assignor to Teknoware Oy, Lahti, Finland

Filed Jan. 4, 1979, Ser. No. 928

Claims priority, application Finland, Jan. 9, 1978, 780060

Int. Cl.[3] H05B *41/29, 41/40*

U.S. Cl. 315—219 **1 Claim**



1. In a motor vehicle having a plurality of independently adjustable fluorescent light tubes, a power regulating inverter circuit for use with each such tube, said inverter circuit comprising an oscillator transistor having an emitter, a collector and a base, a pair of resistors and a transformer all connected to form an inverter circuit having provisions for connections with a DC source on its input and an AC load on its output; an adjustable RC circuit including a potentiometer and a parallel connected capacitor connected to the base of said transistor for controlling the power transmitted to said transformer and any AC load connected thereto; and a switch connected across said RC circuit such that the entire RC circuit is bypassed when said switch is closed and is wholly in the circuit when said switch is open, whereby a momentary closing of said switch after the inverter is turned on will supply full power to said transformer and load while allowing said potentiometer to be set for a predetermined level of power to be supplied upon the opening of said switch following the momentary closing.

4,228,383

SPEED CONTROL CIRCUIT ARRANGEMENT FOR AN AC COMMUTATOR MOTOR

Katsuji Soeda; Mitsuhiro Oyama; Fumio Sakuma, and Tadashi Nakajima, all of Sukagawa, Japan, assignors to Yamamoto Electric Industries, Ltd., Fukushima, Japan

Filed Dec. 28, 1978, Ser. No. 974,116

Claims priority, application Japan, Dec. 28, 1977, 52/158773

Int. Cl.[3] H02P *5/40, 7/28*

U.S. Cl. 318—245 **2 Claims**

1. A speed control circuit arrangement for an AC commutator motor, comprising:

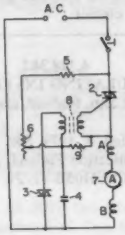
an AC main control element having a control electrode, a first and a second main electrode, and connected at said first main electrode to one end of an external AC power source through a power switch and connected at said second main electrode to the other end of said external AC power source through an AC commutator motor, for controlling a drive current flowing into said motor;

a pulse transformer having a primary and a secondary winding, and connected at said secondary winding between

said control electrode and said second main electrode, for supplying a trigger signal to said control electrode;

a variable resistor for adjusting a rotational speed of said motor;

a first capacitor connected between said first main electrode and the other end of said AC power source with said variable resistor intervening between said first capacitor and said first main electrode;



a pulse generating element connected across said first capacitor with said primary winding intervening therebetween; and

a first resistor connected at one end to said second main electrode and at the other end to the other end of said AC power source through said first capacitor.

4,228,384

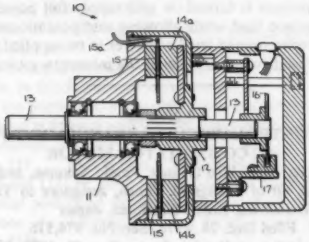
BRUSHLESS DC PRINTED MOTOR

Frank Arnold, Jr., Locust Valley, and Dana F. Geiger, Great Neck, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 8, 1978, Ser. No. 903,677

Int. Cl.³ H02K *29/00*

U.S. Cl. 318—254 **11 Claims**



1. A bidirectional, axial air gap, brushless, printed circuit DC motor comprising:

(a) a rotor having a plurality of permanent magnet poles;

(b) a stator having a flat, ironless, low inductance four layer, stamped armature with at least three fields per pole;

(c) sensing means for sensing the position of said rotor and for producing an output signal indicative thereof;

(d) decoder means connected to said sensing means for decoding said output signal; and

(e) solid state commutating means connected to said armature and to said decoder for successively energizing said fields in accordance with the position of said magnets.

4,228,385

SPEED-REGULATED POSITIONING DRIVE

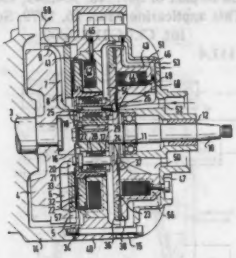
Wolfgang Angersbach, Darmstadt, and Karl-Heinz Meier, Zeilhard, both of Fed. Rep. of Germany, assignors to Quick-Rotan Becker & Notz KG, Darmstadt, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 861,636

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1976, 2657658

Int. Cl.² G05B *5/01*

U.S. Cl. 318—614 **21 Claims**



1. A positioning system comprising, in combination, a drive motor having a drive member; an output shaft and means mounting the output shaft for rotation; an electromagnetically activatable clutch operative when activated for coupling the output shaft to the drive member, the clutch including a movable coupling structure movable between a first position coupling the output shaft to the drive member and a second position in which the output shaft and output shaft are not coupled; an electromagnetically activatable brake operative when activated for braking the output shaft, the brake including a movable braking structure movable between a first position applying braking force to the output shaft and a second position not applying braking force to the output shaft; negative-feedback speed control means including command transducer means generating a desired-speed signal, feedback transducer means generating a actual-speed signal and activating means operative in dependence upon the speed error indicated by the desired- and actual-speed signals for activating the clutch and the brake by applying thereto pulse-width-modulated actuating signals; and positioning means including means generating a position signal indicating when the output shaft has reached a predetermined angular position and means operative when activated for responding to the position signal and stopping the output shaft by activating the brake, further including roller-bearing means mounting the movable coupling structure of the clutch and the movable braking structure of the brake independently of each other on the output shaft non-rotatable relative to the output shaft but axially shiftable relative to the output shaft with a low-friction roller-bearing action, furthermore including a guide body mounted on the output shaft non-rotatable relative thereto, the guide body having a ring-like succession of angularly spaced axially extending openings encircling the output shaft, the roller-bearing means comprising a plurality of roller-bearing connectors each located in one of said openings, circumferentially successive ones of the roller-bearing connectors being alternately connected to the movable coupling structure of the clutch and to the movable braking structure of the brake, respectively, each roller-bearing connector comprising a guide sleeve coupled to a respective one of the movable braking structure of the brake and the movable coupling structure of the clutch, and a ball-bearing sleeve surrounding the guide sleeve and positioning for free rotation a plurality of spherical bearings, the negative-feedback speed control means including a monostable circuit connected to the output of the feedback transducer means and a timing capacitor connected to the monostable circuit, the monostable circuit controlling the charging of the timing capacitor, and further-

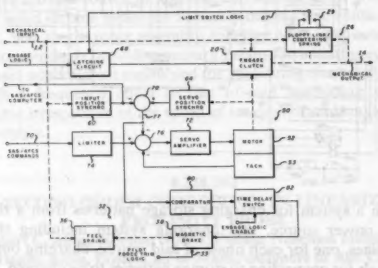
more including means for changing the discharge time of the timing capacitor in dependence upon the commanded speed, the feedback transducer means comprising means for generating pulses at a rate proportional to the rotary speed of the output shaft and frequency-multiplying means receiving the pulses and producing pulses of a higher frequency likewise proportional to the rotary speed of the output shaft, the frequency-multiplying means comprising a monostable circuit which produces an output pulse in response to the leading flank of an input pulse and also an output pulse in response to the trailing flank of an input pulse, the positioning signal being a positioning pulse, the positioning means comprising means for commanding that the output shaft be arrested at the predetermined angular position, means operative in response thereto for detecting the leading flank of the positioning pulse and automatically changing the commanded rotary speed for the output shaft to a lower shut-off value, and means responsive to the trailing flank of the positioning pulse for triggering the arresting of the output shaft.

4,228,386

AIRCRAFT SERVOACTUATOR APPARATUS

Carl D. Griffith, Phoeniz, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 2, 1978, Ser. No. 912,165
Int. Cl.[2] G05B *11/01*
U.S. Cl. 318—628 **12 Claims**



1. A combined series and trim actuator for aircraft automatic stabilization systems comprising:

a housing adapted to be secured directly to the aircraft airframe and including input and output shafts coupled in the control rigging between the pilot's control member and an aircraft control member,

a first coupling means between said input shaft and said output shaft so constructed and arranged to permit resilient, limited relative motion therebetween,

a second coupling means between said input shaft and said output shaft including clutch means so constructed and arranged that in a first state of said clutch means said input and output shafts are directly connected and in a second clutch means state, said input and output shafts are disconnected,

servomotor means having its output connected to drive said output shaft through said second coupling means in said second clutch means state, and

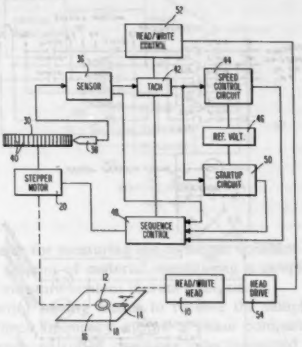
electric signal means repsonsive to the difference in position between said input shaft and said output shaft for controlling said servomotor whereby to position said output shaft in accordance with the position of said input shaft within the authority of said first coupling means.

4,228,387

VARIABLE RELUCTANCE STEPPER MOTOR DRIVE AND METHOD OF OPERATION AS A DC BRUSHLESS MOTOR

W. Sumner Brown, Cambridge, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 14, 1977, Ser. No. 833,265
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—696 **20 Claims**



1. A drive for a magnetic storage disc comprising:

a rotary variable reluctance motor of the stepper type comprising a rotor, a stator having a plurality of pole positions and windings associated with said stator at said pole positions;

a read/write head for reading or writing data on the disc;

means for coupling the rotor to a magnetic storage disc;

means for sensing the position of the rotor;

tachometer means coupled to said sensing means for generating a signal representing the rotational speed of said rotor;

speed control means including a supply voltage means coupled to said tachometer means for producing a supply voltage having a magnitude varying in response to the speed of the motor; and

a sequence control means coupled to said speed control means including means for sequentially supplying said supply voltage to said winding means for sequential energization thereof.

4,228,388

CONTROL CIRCUIT RESPONSIVE TO UTILITY VOLTAGE LEVEL

Gary E. Pochmara, Highland, Mich., assignor to Overhead Conveyor Company, Ferndale, Mich.

Filed Apr. 14, 1978, Ser. No. 896,305
Int. Cl.[3] H02P *7/36*
U.S. Cl. 318—770 **2 Claims**

1. For use in connecting apparatus adapted to be powered by multiple phase electrical energy at either of two discrete voltage levels to a utility power source of unknown voltage level corresponding to one of said two discrete voltage levels, said apparatus including interconnection means adapted to be interconnected in at least two combinations for correspondingly adapting said apparatus to be powered at said two discrete voltage levels, the combination comprising

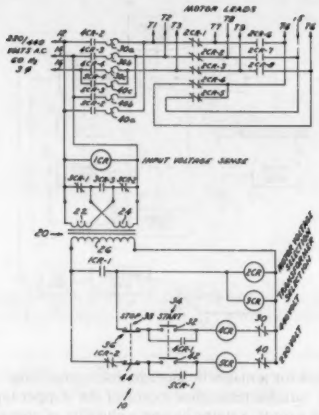
first connection means adapted for connection to a said utility power source;

voltage transformer means having at least two primary windings and a secondary winding;

first control relay means having first voltage sensing means connected to said first connection means and adapted to be responsive to the voltage level of the said utility power source, first relay switch means responsive to said first voltage sensing means for connecting said at least two

primary windings to said first connection means in series at one of said two voltage levels and in parallel at the other of said two voltage levels such that a control voltage is provided at said secondary winding at a preselected discrete voltage level which is independent of said unknown voltage level, and second relay switch means responsive to said first voltage sensing means; and

second control relay means including second voltage sensing



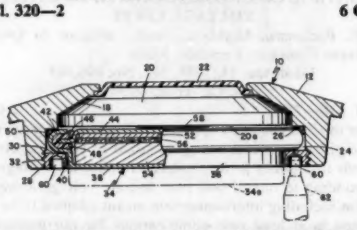
means connected in series with said second relay switch means across said secondary winding and third relay switch means responsive to said control voltage through said second voltage sensing means and to said unknown voltage level through said second relay switch means to so interconnect said interconnection means to said first connection means as to adapt said apparatus to be powered at a one of said two discrete voltage levels corresponding to said unknown voltage level.

4,228,389

NON-REVERSIBLE CONSUMER REPLACEABLE WATCH BATTERY

John Vennard, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 22, 1976, Ser. No. 753,599
Int. Cl.[3] H01M 2/00; G04C 3/00
U.S. Cl. 320—2 **6 Claims**



1. A non-reversible battery and mounting assembly for electrically powered time pieces and the like comprising in combination:

a battery having a casing defining a generally cylindrical configuration and an annular radially extending shoulder adjacent one end defining the forward end thereof, wherein said battery is formed of a generally cup shaped member having a flat bottom thereof defining the back of said watch case, and includes a closure member of a substantially disc shape and said cup shaped member includes side walls crimped over the edge of said disc shaped member for sealing said battery, and said crimped portion of said cup member defines said shouler on said battery,

a component housing having means defining a generally cylindrical battery receiving cavity having an inwardly extending annular shoulder fixed therein for abuttment with said shoulder on said battery,

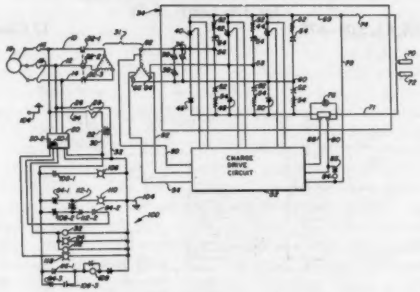
battery retaining means removably mountable within said cavity and having means for cooperatively engaging the walls of said cavity and for engaging and biasing said shoulder on said battery into said cavity for retaining same against said inwardly extending shoulder within said cavity, the length of said battery being at least equal to the length of said cavity, and the length of said battery and said shoulder on said battery in relation to the length of said cavity being such that said battery retaining means can engage the walls of said cavity only with said forward end of said battery extending into said cavity.

4,228,390

BATTERY CHARGER

Raymond L. Knox, Bluefield, W. Va., assignor to A-T-0 Inc., Willoughby, Ohio

Filed Mar. 31, 1978, Ser. No. 892,302
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—38 **8 Claims**



1. In a system for charging storage batteries from a three phase power source, said charging system including three input lines, one for each phase of said source, charging output terminals for connection to storage batteries to be charged, and a charging circuit coupled to said input lines and energizeable by said source for applying a charging signal across said charging output terminals; a control circuit for said battery charging system comprising:

a plurality of contactor means disposed in said input lines and operable to connect said source to said chargng circuit and thereby effect energization thereof; and

circuit means for controlling the operation of said contactor means incuding:

contactor control means energizeable to operate said contactor means;

phase sensitive relay means connected to said input lines and enabled in response to the presence of a source voltage on each of said input lines of selected magnitude and phase sequence;

means connected to said input lines for producing a control signal and for applying said control signal to said phase sensitive relay; and

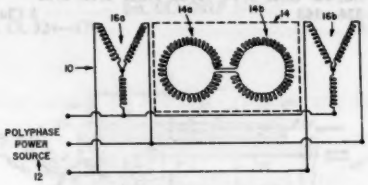
control switch means operable in response to enablement of said phase sensitive relay means and responsive to said applied control signal for connecting said control signal to said contactor control means to effect energization thereof;

whereby said contactor means are operated to energize a charging circuit.

4,228,391
INDUCTION MACHINE

Whitney H. Owen, Ogden, Utah, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1978, Ser. No. 896,539
Int. Cl.[3] H02P 9/46
U.S. Cl. 322—35 7 Claims

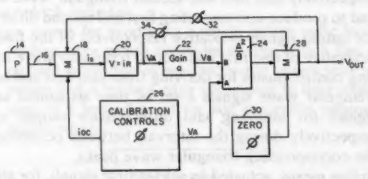


1. A rotary induction machine electric power generating system comprising a single rotor assembly, a first set of rotor windings fixed to said rotor assembly, a second set of rotor windings fixed to said rotor assembly at a location spaced from said first rotor windings, means for connecting each winding of said first rotor windings in series with a winding of said second rotor windings, a first stator winding disposed around said first rotor windings, a second stator winding disposed around said second rotor windings, means associated with one of said stator windings for controlling the current induced in one set of said rotor windings with respect to the current induced in the other set of rotor windings, means for connecting an alternating current source to said first and second statur windings, and wind turbine means for rotatably driving said rotor assembly, said single rotor assembly together with said rotor and stator windings providing unitary means for initiating rotation of said wind turbine means and for generating electrical power with a frequency equal to that of said alternating current source irrespective of the speed of rotation of said single rotor assembly.

4,228,392
SECOND ORDER CORRECTION IN LINEARIZED PROXIMITY PROBE

Robert C. Abbe, Newton; Noel S. Poduje, Needham Heights, and Daniel Klein, Boston, all of Mass., assignors to Ade Corporation, Watertown, Mass.

Filed Oct. 11, 1977, Ser. No. 840,852
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—61 R 18 Claims

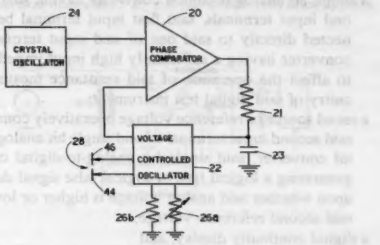


1. A system for providing higher order nonlinearity correction in the linearized output of a dimension gauge comprising:
- a probe sensitive to a physical dimension and providing an output signal varying inversely with said physical dimension;
- means responsive to said probe output for providing a linearized signal varying directly in magnitude with said physical dimension and having higher order nonlinearities in signal magnitude; and
- means for reducing said higher order nonlinearities in signal magnitude in said linearized signal.

4,228,393
MOISTURE METER

James E. Pile, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Aug. 14, 1978, Ser. No. 933,226
Int. Cl.[3] G01R 27/26
U.S. Cl. 324—61 R 9 Claims

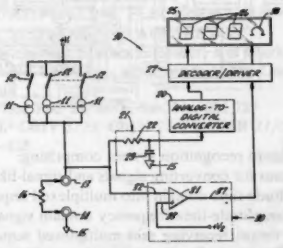


1. A meter for measuring the dielectric constant of a predetermined amount of material constituting a sample to determine the moisture content thereof comprising:
- a capacitor having means to receive the sample, a stable reference frequency means, a phase comparator, and a voltage controlled oscillator interconnected to form a phase-locked loop frequency controller;
- the voltage controlled oscillator being connected to the capacitor to detect a change in capacitance causing the voltage controlled oscillator to change frequency which due to the phase-locked loop condition causes the ouput of the phase comparator to change and maintain the frequency of the voltage controlled oscillator at the frequency of the stable reference frequency means;
- the phase comparator output being proportional to the moisture content of the material; and,
- indicating means connected to the phase comparator and responsive to the output of the phase comparator to indicate the moisture content.

4,228,394
DIGITAL OHMMETER WITH ELECTRICAL CONTINUITY TESTER

John B. Crosby, Yorba Linda, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 16, 1978, Ser. No. 961,154
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—62 7 Claims



1. In a digital test instrument for measuring resistance including a pair of input terminals adapted to be connected across a circuit element of unknown resistance, a first reference current or voltage source operatively couple to said input terminals so that an analog voltage appears across said input terminals which is proportional to the resistance of said circuit element, a filter connected to one of said input terminals for filtering

noise in said analog voltage, an analog-to-digital converter having an input connected to said filter and an output, a digital display, and driver circuit means connected between said output of said analog-to-digital converter and said digital display, the improvement comprising means for detecting and immediately signalling electrical continuity across said input terminals comprising:

a single bit analog-to-digital converter having first and second input terminals, said first input terminal being connected directly to said one of said input terminals, said converter having a sufficiently high input impedance not to affect the operation of said resistance meausring circuitry of said digital test instrument;

a secnd source of reference voltage operatively connected to said second input terminal of said single bit analog-to-digital converter, said single bit analog-to-digital converter generating a logical true or logical false signal depending upon whether said analog voltage is higher or lower than said second reference voltage;

a digital continuity display; and

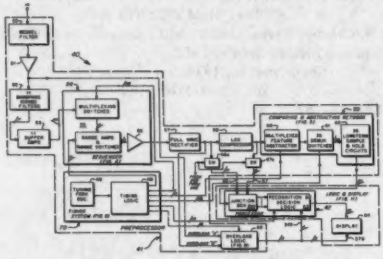
driver circuit means connected between said single bit analog-to-digital converter and said digital continuity display for instantaneously indicating continuity.

4,228,395

FEATURE RECOGNITION SYSTEM

George J. Dusheck, Jr., Cinnaminson, and Phillips B. Scott, Haddonfield, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 6, 1969, Ser. No. 795,392
Int. Cl.[3] G01R *23/16*
U.S. Cl. 324—77 B **17 Claims**



3. A feature recognition system comprising:

first means for converting signals and signal-like noise in the amplitude-time domain into multiplexed sequentially sampled amplitude-time-frequency domain signals; and

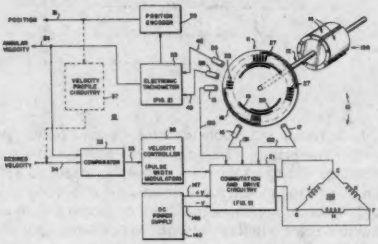
second means receiving said multiplexed sequentially sampled amplitude-time-frequency domain signals including a multiplexed feature abstractor means operatively connected to said first means for abstracting primary features at a controlled rate and said second means further automatically recognizing the relative presence of invariant recognition features associated with said primary features including the positive and negative slopes of said signals in the amplitude-time-frequency domain.

4,228,396

ELECTRONIC TACHOMETER AND COMBINED BRUSHLESS MOTOR COMMUTATION AND TACHOMETER SYSTEM

Gaston A. Palombo, Agoura, and Daniel B. Jones, Thousand Oaks, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed May 26, 1978, Ser. No. 910,126
Int. Cl.[3] G01P *3/44, 13/00*; H02P *3/08, 6/02*
U.S. Cl. 324—163 **5 Claims**



1. A combined electronic tachometer and position determining system for producing a first signal indicative of the rotational velocity of a motor and a second signal indicative of total angular rotation of said motor, comprising:

transducer means, attached to said motor, for producing first and second triangular wave signals of the same period but offset in phase with respect to each other by a fixed angular amount, said same period being directly proportional to the rotational velocity of said motor, said transducer means including:

an optically encoded disc driven by the shaft of said motor and containing a plurality of equally angularly spaced sector marks, and

first and second optical sensors arranged with a fixed angular offset therebetween, each sensor detecting the passage of said sector marks so that the outputs of said optical sensors comprise said first and second triangular wave signals,

first and second differentiators connected to differentiate respectively said first and second triangular wave signals and to produce corresponding first and second differentiator output signals indicative respectively of the first time derivative of said first and second triangular wave signals,

gating control means for deriving from said first and second triangular wave signals a set of time sequential sample signals for sampling said differentiator output signals respectively during the intervals between occurrence of the corresponding triangular wave peaks,

sampling means, actuated by said sample signals, for alternatively sequentially sampling both said first and second differentiator output signals and for providing the resultant sampled outputs to a common line as said velocity indicative signal,

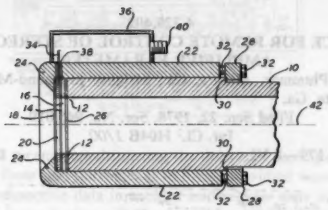
an accumulator, and

position increment means, responsive to occurrence of each of said sample signals, for providing to said accumulator a value indicative of the extent of positional change of said encoded disc required to produce each sample signal, the resultant accumulated contents of said accumulator representing total angular rotation of said motor shaft.

4,228,397
ELECTRONIC VELOCIMETER HAVING AN OSCILLATOR COUPLED COIL FOR MEASURING PROJECTILE MUZZLE VELOCITY

Jimmy Q. Schmidt, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 13, 1978, Ser. No. 959,542
Int. Cl.³ G01P 3/66
U.S. Cl. 324—179 **10 Claims**



1. In an electronic velocimeter for measuring muzzle velocity of a projectile exiting the muzzle of a weapon along a given trajectory, comprising: sensor means which includes;

an annular conductive shield axially aligned in front of and spaced from said muzzle;

a conductive coil insulated from and operatively mounted between said muzzle and said annular conductive shield, said conductive shield and said conductive coil each concentrically encircling said trajectory;

oscillator means electrically coupled to said conductive coil, for generating electromagnetic radiations from said conductive oil, said oscillator means being inductively responsive to passage therethrough of said projectile, for producing localized eddy currents on a metallic surface of said projectile as said projectile moves through said conductive coil, said eddy currents inducing secondary electromagnetic fields which cause a loss due to change in impedance transformations of said conductive coil and modulates the amplitude of an output signal of said oscillator means to be proportional to the geometric shape of said projectile;

timing means for shaping the amplitude of said output signal of said oscillator means and operatively connected for producing a timing signal representing the transit time for said projectile to pass through said sensor means, said timing signal varying inversely proportional to the length of said projectile divided by said projectile muzzle velocity, which includes;

logic means for producing a single output pulse having a leading edge which coincides in time with a first point on said projectile as said projectile passes said sensor means and a trailing edge coinciding in time with passage of a second point on said projectile passing said sensor means.

4,228,398
METHOD OF TESTING DISTANCE RELAYS

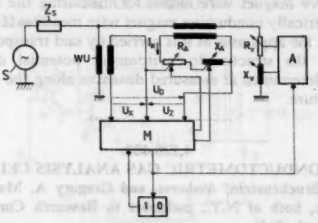
Michael Fiorentzis, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 14, 1979, Ser. No. 38,880
Claims priority, application Switzerland, May 30, 1978, 5874/78
Int. Cl.³ H01H 47/00
U.S. Cl. 324—418 **16 Claims**

1. A method for determining the trip characteristics of distance relays, especially having protection zone switching, for protection of an electrical line by means of variable comparison impedances, wherein the distance relay has a measuring element employed as a comparison instrument, comprising the steps of:

performing a first relay trip test, with a predetermined phase angle ϕ of the comparison impedance Z_1, said comparison impedance having a magnitude greater than the magnitude of a predetermined image impedance Z_A of the line;

performing a second relay trip test, with a magnitude of the comparison impedance $Z_2 \approx Z_1/2$ which is at least approximately half as large as the magnitude of the first comparison impedance Z_1;



during each further relay trip test n, wherein the number n of the relay trip tests are selected as a function of the desired accuracy of the trip characteristic to be determined, performing such relay trip test with a magnitude of the related comparison impedance Z_n which has been increased by at least one-half of the impedance change

$$\frac{|Z_{n-2} - Z_{n-1}|}{2}$$

of the preceding relay trip test when the magnitude of the image impedance Z_A was greater than the magnitude of the comparison impedance Z_{n-1}; or

reducing such comparison impedance at least approximately by one-half of such impedance change

$$\frac{|Z_{n-2} - Z_{n-1}|}{2}$$

of the preceding relay trip test when the magnitude of the image impedance Z_A is smaller or equal to the magnitude of the comparison impedance Z_{n-1}; and

producing a signal which is proportional to the comparison impedance of the last performed relay trip test.

4,228,399
OFFSHORE PIPELINE ELECTRICAL SURVEY METHOD AND APPARATUS

Frank E. Rizzo, Spring; Marvin L. Miller, and Clark Weldon, both of Houston, all of Tex., assignors to Harco Corporation, Medina, Ohio

Filed Feb. 27, 1978, Ser. No. 881,737
Int. Cl.³ G01V 3/15; G01N 27/26; G01R 31/00
U.S. Cl. 324—425 **21 Claims**

1. An apparatus for making offshore structure electrical surveys comprising reference electrode means in the environment proximate the structure, transport means to carry said reference electrode means along the length of the structure in close proximity to the structure, said transport means including

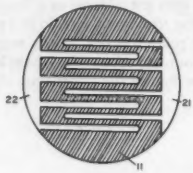
a boat and said reference electrode means being towed behind said boat, a supply of flexible, small gauge, disposable elongate electrically conductive insulated magnet wire means carried by said boat for electrically and mechanically connecting the apparatus with the structure at a reference location thereon, meter means electrically connected to said wire means and electrode means for indicating the potential difference between said reference electrode means and said electrically conductive magnet wire means, and means driven by said electrically conductive magnet wire means for measuring the length of said electrically conductive magnet wire means as it is played out from the apparatus as it is carried by said transport means whereby the structure-to-environment potential difference may be determined at measured distances along the length of the structure.

4,228,400

CONDUCTOMETRIC GAS ANALYSIS CELL

Stanley Bruckenstein, Amherst, and Gregory A. Martinchek, Buffalo, both of N.Y., assignors to Research Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,951
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—450 **13 Claims**



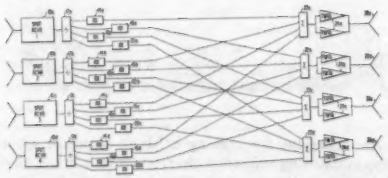
1. A conductometric gas analysis apparatus, comprising: a conductivity cell; and said conductiviy cell comprises a gas permeable membrane having a liquid side and a gas side; a first electrode on said liquid side; a second electrode on said liquid side and spaced from the first electrode; a liquid chamber means for applying and renewing a thin film of liquid over said gas permeable membrane liquid side and said first and second electrodes, a gas chamber means associated with the gas side of the gas permeable membrane, liquid inlet and outlet means for said liquid chamber means, gas inlet means for said gas chamber means, and means for continuously supplying a liquid to the liquid inlet and a gas to be analyzed to the gas inlet.

4,228,401

COMMUNICATION SATELLITE TRANSPONDER INTERCONNECTION UTILIZING VARIABLE BANDPASS FILTER

Marvin R. Wachs, Rockville, and Arnold Berman, Kensington, both of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed Dec. 22, 1977, Ser. No. 863,562
Int. Cl.[2] H04B *7/14*
U.S. Cl. 455/12 **9 Claims**



1. A communications satellite transponder comprising:

means for receiving a plurality of composite signals occupying overlapping frequency bands;

a plurality of groups of variable bandpass filters, each group of filters receiving a different one of said composite signals from said receiving means, and each filter within each group passing a selected portion of the frequency band of its composite signal; and

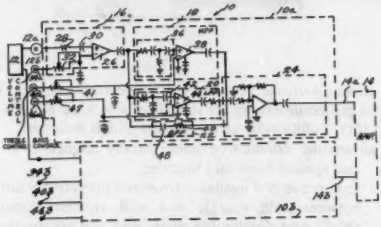
combining means for combining the outputs from said variable bandpass filters into a plurality of composite transmission signals occupying overlapping frequency bands.

4,228,402

DEVICE FOR REMOTE CONTROL OF STEREO HI-FI AMPLIFIER PARAMETERS

Jan P. Plummer, Atlanta, Ga., assignor to Sound-Mate Inc., Atlanta, Ga.

Filed Sep. 22, 1978, Ser. No. 945,019
Int. Cl.[2] H04B *1/00*
U.S. Cl. 179—1 VL **17 Claims**



1. Apparatus for remote control of audio signal parameters in an audio system an audio signal processing component for generating and amplifying said audio signal, said component having at least one record output terminal through which said audio signal is passed prior to final amplification and at least one corresponding record input terminal from which audio signals are passed to final amplification in said component, said apparatus comprising:

a remote control circuit for generating parameter control signals indicative of desired values of said parameters;

intermediate circuit means responsive to said parameter control signals and adapted for electrical connection between said component record output and input terminals for generating a modified audio signal input to said record input terminal having parameters in accordance with said parameter control signals; and

means for communicating said parameter control signals from said remote control circuit to said intermediate circuit.

4,228,403

SUBMULTIPLE-RELATED-FREQUENCY WAVE GENERATOR

Takatoshi Okumura; Akira Nakada; Yasuji Uchiyama; Eiichiro Aoki; Eiichi Yamaga, and Akiyoshi Oya, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 13, 1978, Ser. No. 915,239
Claims priority, application Japan, Jun. 17, 1977, 52-71822; Sep. 1, 1977, 52-105105
Int. Cl.[3] H03K *3/84*; H03B *19/00*; H03K *5/156*
U.S. Cl. 328—15 **11 Claims**

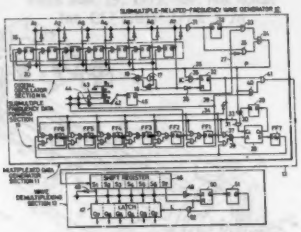
1. A wave generator comprising:

a first means to generate a basic pulse having a basic period which defines a basic frequency;

a second means to generate time division multiplexed data each one of which occures in a corresponding time division multiplex regular time interval and defines the state of a corresponding wave having a frequency which is sub-

multiple-related to said basic frequency, the data in each different corresponding time interval defining a respective different submultiple-related frequency;

a third means to deliver said basic pulse and said time division multiplexed data;



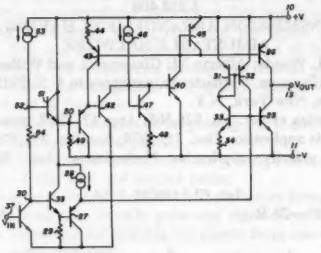
a fourth means demultiplexing the delivered basic pulse and data from said third means to form individual waves from the respective data in each of said regular time intervals, each wave having a frequency defined by said respective multiplexed data.

4,228,404

LOW VOLTAGE COMPOUND INVERTER BUFFER CIRCUIT

Robert J. Widlar, Puerto Vallarta Jalisco, Mexico, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 5, 1979, Ser. No. 8,987
Int. Cl.³ H03F 3/30
U.S. Cl. 330—267 **6 Claims**



1. A compoud buffer inverter for use in an integrated circuit that employs a single power supply connectible between first and second supply rails and that is particularly adapted for operation at low power supply voltages, said compound buffer inverter being operative to provide substantial current gain with a single signal polarity inversion and level shifting capability, said compound buffer inverter comprising:

a first transistor having its emitter coupled to said first rail, its collector providing a current output terminal capable of assuming a potential between said first and second rails and a base;

a second transistor complementary of said first transistor, said second transistor having a collector coupled to said first rail, an emitter coupled to said base of first transistor, and a base coupled to a circuit input terminal;

current supply means coupled between said base of said first transistor and said second rail;

means for operating said first transistor such that its emitter base potential is equal to or greater than the emitter base potential of said second transistor;

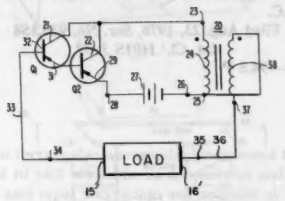
and means for boosting the bias current to said first and second transistors with increasing load current.

4,228,405

LOAD ACTIVATED NORMALLY QUIESCENT WAVEFORM GENERATOR

Kevin G. Rhoads, Lehighton, Pa., and George M. Plotkin, Massapequa Park, N.Y., assignors to VRL Growth Associates, Incorporated, Boston, Mass.

Continuation of Ser. No. 737,641, Nov. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 722,313, Sep. 10, 1976, Pat. No. 4,120,305. This application Apr. 23, 1979, Ser. No. 32,603
Int. Cl.² H03K 3/30
U.S. Cl. 331—65 **5 Claims**



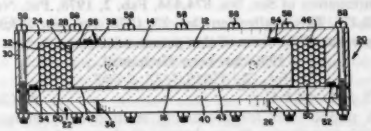
1. A voltage step-up circuit for delivering a stepped up voltage to a pair of output electrodes comprising: a normally quiescent oscillator circuit constituted by an inverting high gain transistor amplifier, said transistor amplifier having an emitter-collector output circuit and a base-emitter input circuit; a source of unidirectional voltage; an inverting voltage step-up transformer having a low voltage primary winding and a high voltage secondary winding; a first series circuit constituted by said source of unidirectional voltage, said emitter-collector circuit and said primary winding; and a second series circuit feedback arrangement constituted by said secondary winding, said pair of output electrodes, said base-emitter input circuit and said source of unidirectional voltage; said quiescent circuit being rendered oscillatory solely upon the presence of a high resistance load across said output electrodes.

4,228,406

LASER APPARATUS

Owen Lewis, Fairport, and Edmund M. Stogran, North Syracuse, both of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Continuation of Ser. No. 738,500, Nov. 11, 1976, abandoned. This application May 10, 1978, Ser. No. 904,690
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 D **14 Claims**



1. In laser apparatus having a laser element for emitting laser radiation in the form of a solid body containing active laser material, said laser element body having first and second surfaces at the ends thereof and a third surface extending longitudinally between said first and second surfaces, an improved mounting for said laser element comprising a housing defining with said third surface a chamber adjacent to said third surface, said chamber being spaced radially outward from said third surface and being disposed along said third surface, a multiplicity of spherical bodies, said spherical bodies being disposed in contact with each other and extending along said third surface and radially outward to completely fill said chamber so as to support the weight of said laser element body in said housing, said spherical bodies having diameters such that a plurality of

said spherical bodies extend longitudinally along said third surface and another plurality of said spherical bodies extend radially outward from said third surface, said plurality of spherical bodies which extend along said third surface being in contact therewith.

4,228,407

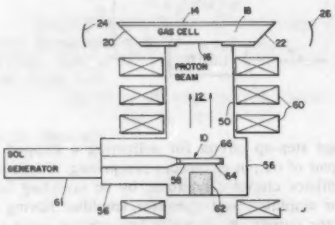
ION-BEAM-EXCITED GAS LASER

A. Wahab Ali, Rockville; Jeffry Golden, Laurel; J. Gary Eden, Bowie; Redge A. Mahaffey, Wheaton, all of Md., and John A. Pasour, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1978, Ser. No. 936,158

Int. Cl.³ H01S *3/09*

U.S. Cl. 331—94.5 P **33 Claims**



1. In a high-pressure gas laser system comprising a high pressure gas cell filled with one or more laser gases at a total pressure greater than 0.1 atmosphere but not more than 10 atmospheres, said system including Brewster angle windows which are transparent to the laser output at each end of the gas cell in optical alignment about the optical axis of said gas cell and which provide a means for extraction of laser radiation, the improvement comprising:

means for producing a directed, pulsed beam of ions with sufficient energy and density to provide a pump source to excite said high-pressure gas in the laser system so that a population inversion results for an excited state of the laser gas.

4,228,408

PULSED CYCLIC LASER BASED ON DISSOCIATIVE EXCITATION

Erhard J. Schimitschek, and John E. Celto, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 874,434, Feb. 2, 1978, Pat. No. 4,168,475. This application Oct. 23, 1978, Ser. No. 953,381

The portion of the term of this patent subsequent to Sep. 18, 1996, has been disclaimed.

Int. Cl.³ H01S *3/22, 3/097*

U.S. Cl. 331—94.5 G **37 Claims**

1. A pulsed laser for producing emitted laser energy by dissociative excitation in an electric discharge of metal dihalides and their cyclic recombination comprising:

a sealed enclosure;

first and second electrodes having external terminals and supported within said sealed enclosure for forming a gap therebetween;

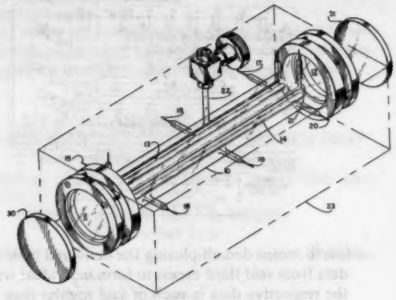
a source of pulsed electrical power connected to said terminals for producing a uniform electric discharge across said gap at pressures optimized for the lasing process;

a metal dihalide selected from subgroup II-B of the periodic table of elements and contained within said enclosure;

means for maintaining said metal dihalide in a vaporized state;

a buffer gas contained within said sealed enclosure and selected for aiding electric discharge uniformity and for aiding in the dissociative excitation of the lasing medium and to provide vibrational relaxation of the lasing medium in its electronic states;

means disposed within said sealed enclosure for preionizing the lasing medium within said enclosure in response to pulses of electrical power cyclically applied in synchronism immediately prior to the pulses produced by said source of pulsed electrical power; and



two reflective surfaces disposed and aligned relative to said sealed enclosure for producing optical feedback for the emitted laser energy.

4,228,409

TRANSMISSION ARRANGEMENT HAVING AN ADJUSTABLE NETWORK

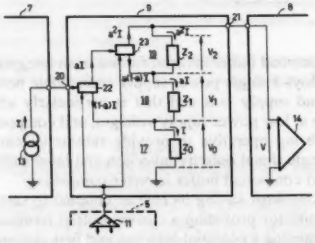
Kornelis J. Wouda; Alberto M. Giacometti, and Willem Riede, all of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 825,305, Aug. 17, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 971,770

Claims priority, application Netherlands, Aug. 30, 1976, 7609605

Int. Cl.² H03H *7/14*

U.S. Cl. 333—28 R **9 Claims**



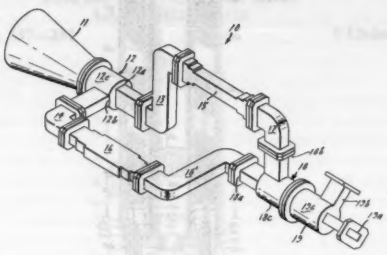
1. Transmission arrangement comprising at least one adjustable network having a transfer characteristic between input and output as a function of the frequency ω within a predescribed frequency band approximately equal to C exp [kf(ω)], where C is a constant and k a continuously variable parameter, wherein the adjustable network comprises a plurality of channels between input and output, the transfer characteristic of a channel being approximately proportional to a term, different for each channel, from the series of terms of the development of exp {kf(ω)} to powers of kf(ω), the number of terms corresponding with the number of channels.

4,228,410

MICROWAVE CIRCULAR POLARIZER

Kenneth R. Goudey, Sunnyvale, and Attilio F. Sciambi, Jr., Los Altos, both of Calif., assignors to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Jan. 19, 1979, Ser. No. 4,628
Int. Cl.[2] H01P 1/16, 5/16
U.S. Cl. 333—122 **10 Claims**



1. A polarizer for converting a linearly polarized microwave signal to an elliptically polarized microwave signal and vice versa, said polarizer comprising:

compensation means for passing a signal between two points by a first path and a second path, said first and second paths producing a relative phase shift between the signal carried in said first path and the signal carried in said second path, said first and second paths each having a different length and width with respect to microwave signal propagation so that the phase vs. frequency characteristic of the signal has a point of inflection and there are two frequencies at which said phase shift is exactly a desired predetermined value, said first and second paths being rectangular waveguides and the signal passed by said first and second paths having a band of frequencies including two frequencies having said desired phase shift, the axial ratio being held to a specific design value over the band of frequencies,

a first dual mode transducer for joining a first end of each of said first and second paths,

a second dual mode transducer for joining a second end of each of said first and second paths;

said first and second dual mode transducers being adapted for joining two linearly polarized signals into one polarized signal and for splitting the power from one signal into two equal portions;

said first path including a longitudinally symmetrical decreasing and then increasing width with respect to longitudinal travel along said first path and;

said second path including a longitudinally symmetrical increasing and then decreasing width with respect to longitudinal travel along said second path, said increases being equal to said decreases in any given path, and only a decrease or an increase occurring in any given half about the midpoint of any given path.

4,228,411

BROADBAND FREQUENCY DIVIDER IN WAVEGUIDE

Robert G. Harrison, Montreal, Canada, assignor to Com Dev Ltd., Dorval, Canada

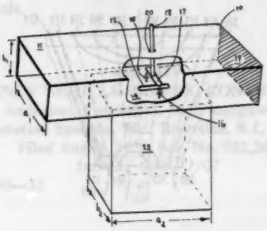
Filed Apr. 3, 1979, Ser. No. 26,765
Int. Cl.[3] H01P 1/20
U.S. Cl. 333—218 **9 Claims**

1. A microwave frequency divider, comprising:

an input rectangular waveguide dimensioned to propagate a band of input frequencies;

an elongated slot substantially centered in one broadwall of said input rectangular waveguide, the slot substantially extending in parallel with a normal propagation direction of an input TE_{10} mode wave;

a pair of nonlinear capacitive reactance elements symmetrically and operatively disposed one along either long side of said slot so as to form therewith a resonance loop turned at subharmonic frequencies of about half the microwave frequencies of the input band; and



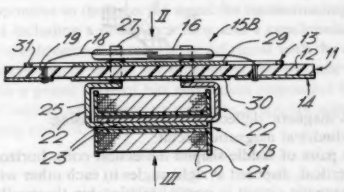
an output rectangular waveguide dimensioned to propagate a band of said subharmonic frequencies and so-disposed about said input waveguide and said slot as to define an output wave propagation direction substantially perpendicular to the propagation direction of the input wave.

4,228,412

ELECTRICAL SWITCHING APPARATUS AND ENERGIZING CIRCUITS THEREFOR

Robert J. Dalley, Camberley; Robert D. Owen, Farnborough, and George S. Parmenter, Hartley Wintney, all of England, assignors to The Solartron Electronic Group Limited, Farnborough, England

Filed Mar. 7, 1978, Ser. No. 884,309
Claims priority, application United Kingdom, Mar. 8, 1977, 09602/77
Int. Cl.[2] H01H 1/66, 51/00
U.S. Cl. 335—152 **13 Claims**



1. Electrical switching apparatus for an electrical scanner unit, wherein a printed circuit board carries a plurality of reed relays each comprising an electric coil and at least one reed contact unit, wherein the coils are disposed on one surface of the board and the contact units are disposed on the other surface opposite their respective coils, and wherein screening means of substantially non-magnetic, electrically- and thermally-conductive material is disposed between each contact unit and its respective coil.

4,228,413

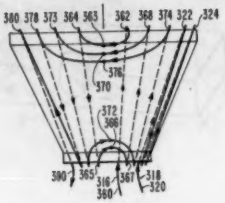
SADDLE-TOROID DEFLECTION WINDING FOR LOW LOSS AND/OR REDUCED CONDUCTOR LENGTH

Francis J. Campbell, Yardley, Pa., and William H. Barkow, Pennsauken, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,417
Int. Cl.[3] H01F 5/00
U.S. Cl. 335—213 **2 Claims**

1. A deflection yoke adapted for deflection of an electron beam of a kinescope, comprising:

deflection winding means including first and second winding portions lying along the inner surface of a magnetically permeable annular core in a nonoverlapping manner for producing a field upon the passage of a deflection current therethrough for deflecting the electron beam to form a line, said winding means further comprising first return



conductors disposed at the entrance and exit ends of said core and associated with said first winding portions to form saddle windings, said winding means also comprising second return conductors girdling said core and associated with said second winding portions to form toroidal windings.

4,228,414

MAGNETIC DEFLECTION SYSTEM

Albertas V. Bauzhis, ulitsa Marshala Krylova, 34, kv. 50; Petr P. Kornyak, ulitsa Daryaus-Gireno, 8, kv. 90; Vitautas K. Razhaitis, ulitsa Greifenbergerisa, 3, kv. 27, and Ioselis K. Shneideris, ulitsa Gagarina, 5, kv. 28, all of Vilnjus, U.S.S.R.

Filed Jan. 12, 1979, Ser. No. 3,517
Int. Cl.[2] H01F 5/00
U.S. Cl. 335—213 **1 Claim**

1. A magnetic deflection system comprising:
a cylindrical magnetic circuit;
two pairs of saddle-shaped deflection coils, horizontal and vertical, disposed at right angles to each other within said magnetic circuit in coaxial relationship therewith;
each of said coils having a longitudinal portion and a lateral portion which mate together through a jointing area;
said jointing area of each said coil has its cross-section of a variable thickness, which cross-section diminishes from a maximum value measured along a section through a boundary line of the jointing area limiting either said longitudinal portion or said lateral portion to a minimum value measured along a section that passes through the jointing area at right angles to the deflection plane of the electron beam.

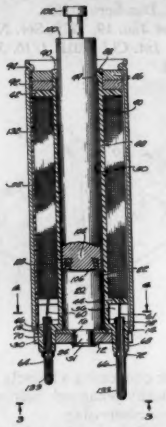
4,228,415

COMPACT SOLENOID WITH PIN TERMINALS

Spencer C. Schantz, 5880 Anchorage Rd., Oconomowoc, Wis. 53066

Filed Jul. 26, 1978, Ser. No. 928,208
Int. Cl.[3] H01F 7/10
U.S. Cl. 335—255 **13 Claims**

1. In a tubular electromagnetic solenoid having a bobbin, a coil wound on the bobbin, a bore in said bobbin, and a ferromagnetic plunger axially movable within said bore, the improvement comprising a tubular deep drawn ferromagnetic housing for said bobbin and coil, said housing being relatively thin walled and having an integrally formed end wall, a ferromagnetic pole piece having a first portion sized to fit within said bore and a second mounting portion, a first ferromagnetic



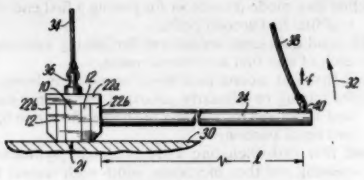
flux disc to add effective flux carrying thickness to said housing end wall, and means for securing said second pole piece portion to said flux disc, with said end wall located therebetween.

4,228,416

COMPOSITE MAGNET AND MAGNETIC ANCHORING

Saul I. Slater, Miami Beach, Fla., assignor to Hov-Air-Ship, Inc., Miami Beach, Fla.

Filed Sep. 15, 1978, Ser. No. 942,706
Int. Cl.[2] H01F 7/04, 7/02
U.S. Cl. 335—295 **11 Claims**



1. A composite magnet assembly which comprises:
at least two magnet members oriented to have their polar axes generally parallel and in the same polar orientation;
a pair of pole members made of a magnetically attractive material, each said pole member adapted to abut all the magnetic poles of similar polarity of said magnet members, such that each said pole member becomes a unipolar composite magnetic pole;
a casing member encasing said magnet members and said pole members to expose an edge of each pole member, said exposed edges defining a generally planar magnetic engaging surface and said casing providing a bearing edge adjacent and parallel to said engaging surface, said casing being proportioned with its edge portion adjacent said bearing edge being beveled; and
leverage means attached to said casing, said leverage means adapted to enable said casing to be rotated about said bearing edge, such that magnetic engagement between said engaging surface and any magnetically attractive structure can be relatively easily interrupted by rotating said anchoring assembly, by said leverage means, about

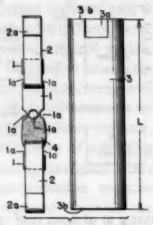
the bearing edge, the beveled casing edge facilitating rotation about said bearing edge.

4,228,417

ELECTRIC FUSE AND METHOD OF MANUFACTURING THE SAME

Richard A. Belcher, Hampton Falls, N.H., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 30, 1979, Ser. No. 62,267
Int. Cl.³ H01H *85/16*
U.S. Cl. 337—252 **9 Claims**



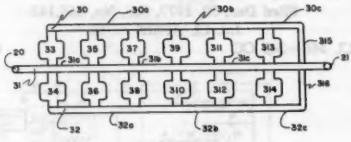
1. A sub-assembly of an electric fuse comprising a tubular casing of electric insulating material having a pair of rims, a perforated fusible ribbon element inside said casing, said fusible ribbon element having a pair of ribbon ends bent around said pair of rims from the inside of said casing to the outside thereof, wherein the novel features consist in that said casing has at least one slot extending axially inwardly from one of said pair of rims and being of sufficient length to allow insertion of said fusible ribbon element and its ribbon ends into said casing with said pair of ribbon ends in pre-bent state and said pair of ribbon ends and said slot being angularly displaced relative to each other.

4,228,418

MODULAR TRIM RESISTIVE NETWORK

James R. Piedmont, Alexandria, and Michael Hacskaylo, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 28, 1979, Ser. No. 24,808
Int. Cl.³ H01C *10/00*
U.S. Cl. 338—195 **1 Claim**



1. A trimmable resistive network consisting of a plurality of two-branched series resistors of essentially equal resistive elements connected in parallel, wherein each parallel branch consists of two resistive elements having first and second ends with the second ends connected in common;

first and second conductive means including severable segmented conductive portions progressively interconnecting corresponding respective resistive element ends with the first conductive means interconnecting all the first ends of the resistive elements and the second conductive means interconnecting all the second ends of the resistive elements;

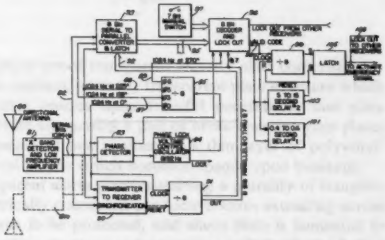
an input terminal connected to the second conductive means and an output terminal connected to a common junction of the first and second conductive means whereby selective severing of the segmented conductive sections selectively provides for separate input and output paths for a simple trimmable resistive network of parallel resistive elements or a parallel two branched series resistive network and whereby further selective severing of various segments of the conductive means interconnecting the ends of the various resistive elements provides for a precisely controlled resistance across the input and output terminals.

4,228,419

EMERGENCY VEHICLE TRAFFIC CONTROL SYSTEM

George P. Anderson, Pawtucket, R.I., assignor to Electronic Implementation Systems, Inc., Riverside, R.I.

Filed Aug. 9, 1978, Ser. No. 932,264
Int. Cl.² G08G *1/07*
U.S. Cl. 340—32 **5 Claims**



1. An emergency traffic control system having in combination traffic lights including at least a proceed lamp and a stop lamp for directing the flow of vehicle traffic and a control system for said lamps, said control system comprising a first means to directionally receive a directionally transmitted pulse width-modulated signal including word bits transmitted from a vehicle; second means to detect the received signal; third means responsive to the detected signal for reconstructing said signal and including a phase lock loop and a synchronization circuit to synchronize said reconstructed signal with the transmitted signal; fourth means for comparing the reconstructed signal with a preset code of bits and means responsive to the output of said fourth means to generate a control signal to initiate lamp control.

4,228,420

MOSAIC OF CODED APERTURE ARRAYS

Edward E. Fenimore, and Thomas M. Cannon, both of Los Alamos, N. Mex., assignors to The United States Government as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 14, 1978, Ser. No. 942,228
Int. Cl.³ G02B *5/00*; G03B *5/17*
U.S. Cl. 340—146.3 F **4 Claims**

1. An imaging arrangement for a coded aperture imaging system comprising:

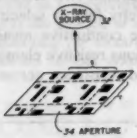
a source of nonfocusable radiation;

a position sensitive detector;

mosaic array aperture means formed from a basic r by s array and neighboring cyclic versions of said basic r by s array adjacent to said basic r by s array, said mosaic array aperture means substantially aligned with said source of nonfocusable radiation and said position sensitive detector to form an encoded aperture image;

said encoded aperture image formed by a circular correlation of said mosaic aperture array and said source of nonfocusable radiation such that all object source points of said source of nonfocusable radiation contribute a com-

plete cyclic version of said basic r by s array within a minimal detector area for sources aligned off axis;



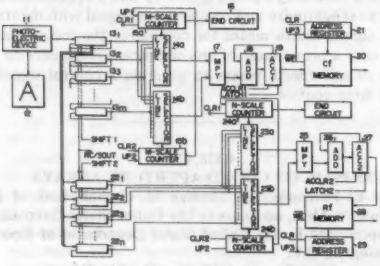
means for reconstructing an image of said source from said encoded aperture image.

4,228,421

PATTERN IDENTIFICATION SYSTEM

Haruo Asada, Kawasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 22, 1979, Ser. No. 22,875
Claims priority, application Japan, Mar. 28, 1978, 53-34803
Int. Cl.[2] G06K 9/12
U.S. Cl. 340—146.3 MA **7 Claims**



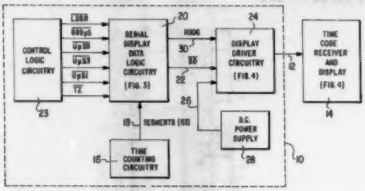
1. A pattern identification system comprising memory means for storing a plurality of standard pattern data each calculated based on covariance matrix of a set of pattern components known to belong to a corresponding one of a plurality of categories; calculation means for obtaining an input pattern data based on covariance matrix of a set of pattern components of an input pattern; multiplier-adder means for multiplying and summing the element included in the covariance matrix of the input pattern data and the corresponding element of the covariance matrix of each standard pattern data; detection means for detecting the largest of the results obtained by the multiplier-adder means with respect to all categories; and identification means for identifying the input pattern as belonging to the category represented by the largest result detected by the detection means.

4,228,422

SYSTEM FOR DISPLAYING AT A REMOTE STATION DATA GENERATED AT A CENTRAL STATION AND FOR POWERING THE REMOTE STATION FROM THE CENTRAL STATION

James C. Perry, Bowie, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1978, Ser. No. 965,367
Int. Cl.[3] H04B 3/54; G04C 13/02
U.S. Cl. 340—310 A **13 Claims**


CONTROL LOGIC CIRCUITRY
SERIAL DISPLAY DATA LOGIC CIRCUITRY (FIG. 3)
DISPLAY DRIVER CIRCUITRY (FIG. 4)
TIME CODE RECEIVER AND DISPLAY (FIG. 4)
SEGMENTS (63)
D.C. POWER SUPPLY
TIME COUNTING CIRCUITRY

1. A system for displaying at at least one remote station data generated at a central station and for powering the remote station from the central station, said system comprising:

means at the central station for generating a data signal;

means at the central station for generating a power signal;

means at the central station for time multiplexing the data signal and power signal over a plurality of successive cycles so that said data signal occurs during a first interval of each cycle and said power signal occurs during a second interval of each cycle;

transmission means for transmitting the time multiplexed signals to the remote station;

storage means at the remote station responsive to the transmitted time multiplexed signals for storing said power signal; and

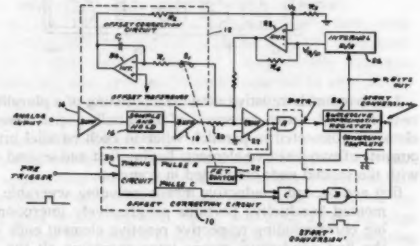
display means at the remote station for displaying said data signal, said display means being powered by said storage means during said first interval of each cycle.

4,228,423

OFFSET CORRECTION APPARATUS FOR A SUCCESSIVE APPROXIMATION A/D CONVERTER

Christopher B. Schwerdt, Catonsville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 30, 1977, Ser. No. 866,143
Int. Cl.[2] H03K 13/02
U.S. Cl. 340—347 CC **6 Claims**



1. A successive approximation analog-to-digital converter in combination with an offset correction generating means and offset correction control means wherein

said converter includes a successive approximation register for providing a successive approximation digital signal upon receipt of an analog input signal, a digital-to-analog

converter connected to the output of said successive approximation register, a comparator having an output for connection to the input of said register, a dual input amplifier connected between said digital-to-analog converter and an input to said comparator, said comparator also being connected to receive the input analog signal to be digitized by the analog-to-digital converter,

said offset correction generating means being connected to receive an offset reference voltage and selectively connected to receive the output from said dual input amplifier to provide an offset correction output signal which is applied to the other input of said dual input amplifier, the output of which is an offset correction voltage; and

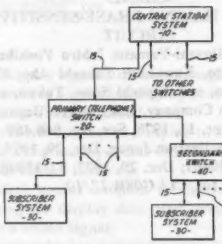
said offset correction control means controls the selective connection of said offset correction generating means to said comparator, said correction control means including a logic gate connected between said comparator and said successive approximation register, said logic gate being operable upon receipt of a pretrigger signal to interrupt the normal analog-to-digital conversion and force said successive approximation register to have a predetermined state imposed thereon such that the correction voltage output from said dual input amplifier may be applied to said successive approximation register through said logic gate.

4,228,424

CENTRAL STATION ALARM

Tom W. Le Nay, Encino; Donald L. Hadden, Fountain Valley, and George S. Beckwith, Sherman Oaks, all of Calif., assignors to Baker Protective Services, Incorporated, Beverly Hills, Calif.

Filed Oct. 16, 1978, Ser. No. 951,958
Int. Cl.[3] G08B *26/00*
U.S. Cl. 340—506 **21 Claims**



1. An alarm apparatus operating within a predetermined set of operating parameters comprising

first input means adapted to receive at least one signal representative of the status of an alarm sensor,

second input means for entering changes to said operating parameters other than actuating or deactuating said alarm apparatus,

sequencing means responsive to said first and second input means for generating signals representative of the status of at least one alarm sensor and the changes received from said second input means, and

transmitting means for communicating to a central alarm station the status of the at least one alarm sensor together with the changes to system operating parameters.

4,228,425

TAMPER-PROOF TRANSPARENT SECURITY PLATE

William C. Cooke, Kingsport, Tenn., assignor to AFG Industries, Inc., Kingsport, Tenn.

Filed Feb. 6, 1978, Ser. No. 875,283
Int. Cl.[2] G08B *13/04, 13/12;* E05G *1/10*
U.S. Cl. 340—550 **3 Claims**

1. A tamper-proof transparent security plate comprising:

a break-resistant, normally transparent plate structure which becomes opaque upon forceful penetration, said plate structure comprising a pair of break-resistant glass plates laminated to one another by a thin layer of polyvinyl-butyral plastic which becomes opaque upon breakage;

a transparent alarm plate containing a plurality of frangible electrically connected conductive wires extending across an area to be protected, said alarm plate is laminated to said plate structure and comprises a single sheet of glass containing said wires embedded within said sheet; and

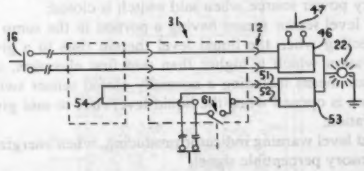
a variable voltage source connected to said wires for varying the current passing through said wires to provide said security plate with an optional heating, de-icing, or defogging capability.

4,228,426

HOSPITAL BED MONITOR

William A. Roberts, 340 Morietti Dr., Concord, Calif. 94520

Filed Sep. 29, 1978, Ser. No. 946,960
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—573 **6 Claims**



1. In a nurse call system having a plug adapted for attachement to a receptacle, said plug having a shorting connection for completing an electrical alarm circuit that activates an alarm when not completed, the improvement comprising

a flat pressure actuated switch adapted for disposition on a hospital bed,

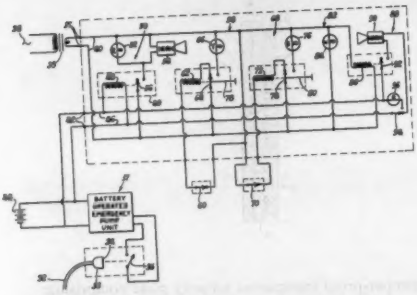
an electrical connector adapted for insertion between said plug and receptacle, and having separated terminals in a wire normally connecting said alarm circuit via said shorting connection; and

means connecting said pressure-operated switch across said terminals of said connector to complete said electrical circuit only when said switch is pressure activated.

4,228,427
MONITOR APPARATUS FOR SUMP PUMPS

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

Filed Mar. 29, 1979, Ser. No. 24,959
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—623 3 Claims



1. In a monitor apparatus for a pump system for a sump or the like, which system includes a primary pump operated from a primary electrical power source, a secondary pump operated by an auxiliary electrical power source, and control means for energizing the primary pump from its source when the liquid level in the sump reaches a first, relatively low, elevation and for energizing the secondary pump from its source when the liquid level in the sump reaches a second, relatively high elevation, the improvement comprising:

first means for connecting said monitor apparatus to said primary power source to supply electrical power to said monitor apparatus from said primary power source;

second means for connecting said monitor apparatus to said auxiliary power source to supply electrical power to said monitor apparatus from said auxiliary power source;

relay means comprising a normally closed switch and connections at which when power is applied thereto will cause said switch to open;

means connecting said relay connections to said second means whereby said switch is open so long as said auxiliary power source is supplying electrical power to the monitor apparatus;

an auxiliary power source failure indicator producing, when energized, a sensory perceptible signal;

circuit means connecting said first means, said switch and said indicator for energizing said indicator from said primary power source when said switch is closed;

water level sensor means having a portion in the sump for detecting when the liquid level therein rises to a given elevation which is higher than said first elevation, said sensor means including a normally closed sensor switch which is opened when the liquid level rises to said given elevation;

a liquid level warning indicator producing, when energized, a sensory perceptible signal;

a second relay means comprising a second normally closed switch, switch holding means manually actuatable to an active condition, and connections at which when power is applied thereto and said holding means is in said active condition will cause said second switch to open and remain open so long as said switch holding means remains in said active condition, said holding means returning to an inactive condition when power ceases to be supplied to said connections of the second relay means;

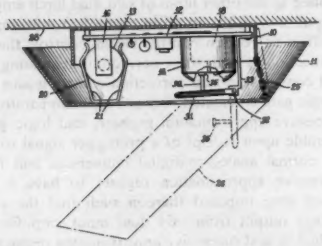
circuit means connecting said first means, said indicator and said second switch in series whereby said indicator is energized when said second switch is closed; and

circuit means connecting the connections of the second relay means, the sensor switch and the first means in series to apply electrical power to the connections of the second relay means so long as the sensor switch is closed.

4,228,428
VISIBLE SIGNAL FOR ALARM, SUCH AS A SMOKE DETECTOR

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

Filed Apr. 2, 1979, Ser. No. 26,336
Int. Cl.[3] G08B 17/10, 00/00
U.S. Cl. 340—628 5 Claims



1. A visible signal apparatus for an alarm device such as a smoke detector or the like, which alarm device is powered by a battery member and includes a horn with a diaphragm member which is vibrated to produce an audible alarm signal and a frame, said apparatus being characterized by:

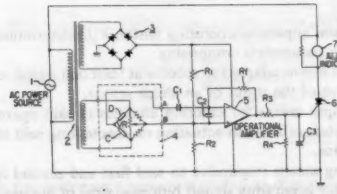
a signal flag hingedly connected to said frame, said flag having a distal terminus spaced from the hinge connection to the frame, said flag being movable by gravity about said hinge connection between an upper position in juxtaposition to said member and a lower position away from said member; and

means secured to the flag, spaced from the hinge connection and releasably engaging one of said members and holding said flag in said upper position whereby when said engagement does not exist said flag will move to said lower position.

4,228,429
ALARM SYSTEM HAVING PHASE-SENSITIVE BRIDGE CIRCUIT

Keishin Tsuchiya, Higashi-Yamato; Ichiro Yoshihara, Funabashi; Kazuhito Saito, Kawasaki; Takeshi Abe; Kiyoshi Abe, both of Yokohama, and Kiyoshi Sone, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 968,469
Claims priority, application Japan, Dec. 29, 1977, 52/159460; Dec. 29, 1977, 52/159461; Dec. 29, 1977, 52/159462
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—632 4 Claims



1. An alarm system comprising

(a) an AC power supply circuit,

(b) a full-wave rectifier for effecting full-wave rectification of the alternating current supplied from said AC power supply circuit,

(c) an AC bridge circuit which is supplied with the power from said AC power supply circuit and which includes a sensor element in at least one branch of the bridge thereof,

(d) a DC blocking capacitor having one terminal connected to an output terminal of said bridge circuit,

(e) an operational amplifier which is supplied with power from said full-wave rectifier and receives the output signal from said AC bridge circuit through said DC blocking capacitor, an input terminal of said amplifier being connected to the other terminal of said blocking capacitor,

(f) a thyristor having main electrodes connected to said AC power supply circuit and a control electrode for receiving the output signal from said operational amplifier, and

(g) an alarm indicator coupled to at least one of said main electrodes of said thyristor and actuable when said thyristor is triggered into the conduction state by said operational amplifier output signal when the phase of the AC output signal from said AC bridge circuit is reversed by 180° due to the variation in resistance of said sensor element under abnormal conditions.

4,228,430

CRT DISPLAY APPARATUS WITH CHANGEABLE CURSOR INDICIA

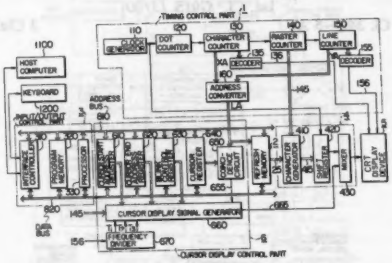
Masahiro Iwamura; Nagaharu Hamada, both of Hitachi; Schigeo Kuboki, Nakaminato, and Kenichi Fukushima, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1977, Ser. No. 860,117

Claims priority, application Japan, Dec. 17, 1976, 51-150859

Int. Cl.³ G06F *3/14*

U.S. Cl. 340—709 **2 Claims**



1. A CRT display apparatus comprising:

a refresh memory for storing display data for one frame of an image in the form of coded data;

input/output control means coupled to the refresh memory for controlling the input and output of information to and from said refresh memory;

video control means coupled to the refresh memory for converting the display data read from said refresh memory into a video signal;

a CRT display device coupled to the video control means for converting said video signal into a visible image;

timing control means coupled to the refresh memory, the video control means and the CRT display device for generating a plurality of synchronizing signals for a raster scanning of said CRT display device and for generating a display address for reading said refresh memory corresponding to said raster scanning; and

cursor display control means coupled to the timing control means, the video control means, and the input/output means for generating a cursor display signal,

wherein said cursor display control means comprises:

a cursor start address register coupled to said input/output control means for producing a programmed cursor start address;

a cursor end address register coupled to said input/output control means for producing a programmed cursor end address;

a cursor register coupled to said input/output control means for generating a cursor display address;

a cursor coincidence detector coupled to said timing control means and said cursor register for producing a cursor coincidence signal representative of coincidence of said display address with said cursor display address;

a first coincidence detector coupled to said cursor start address register and said timing control means for producing a first signal pulse representative of coincidence of said programmed cursor start address and said display address;

a second coincidence detector coupled to said cursor end address register and said timing control means for producing a second signal pulse representative of coincidence of said programmed cursor end address and said display address;

a first differentiating circuit coupled to said first coincidence detector for producing a third signal pulse representative of a leading edge of said first signal pulse;

a second differentiating circuit coupled to said second coincidence detector for producing a fourth signal pulse representative of a trailing edge of said second signal pulse;

a flip-flop set by said third signal pulse and reset by said fourth signal pulse for producing the cursor display signal; and

a gate for passing said cursor display signal to said video control means only at a period during which said cursor coincidence detector produces the cursor coincidence signal.

4,228,431

ELECTROCHROMIC DISPLAY DEVICE

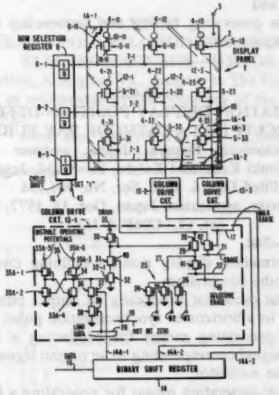
Donald J. Barclay, Winchester; Colin L. Bird, Eastleigh; Michael H. Hallett, Eastleigh, and David H. Martin, Eastleigh, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1977, Ser. No. 860,265

Claims priority, application United Kingdom, Dec. 22, 1976, 53515/76

Int. Cl.² G06F *3/14*; G09F *9/32*

U.S. Cl. 340—719 **4 Claims**



1. Electrochromic display apparatus, comprising:

an electrolyte containing an electrochromic material,

a plurality of display electrodes in said electrolyte,

said display electrodes being electrically connected in at least one group to enable selection of display electrodes,

means for selecting at least some display electrodes,

means to effect deposition of a visible coating of coloured

species derived from the electrochromic material onto said selected display electrodes, and

means to effect deposition of an invisible coating of the coloured species onto all unselected display electrodes,

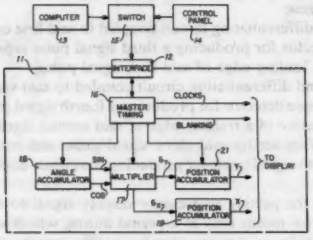
whereby the potentials of selected and unselected display electrodes are equalised.

4,228,432

RASTER SCAN GENERATOR FOR PLAN VIEW DISPLAY

Scott R. Osborne, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1979, Ser. No. 70,294
Int. Cl.³ G06F 3/53
U.S. Cl. 340—736 **6 Claims**



1. A raster scan generator of the type receiving instructions from an external source and for generating different formats of rasters for a plan view display comprising,

interface means connected with an external source for receiving parameters for raster patterns,

an angle accumulator connected with said interface means for computing angles of rotation for successive lines of a raster pattern, and providing incremental horizontal and vertical values for generating each line of a raster pattern,

position accumulator means connected with said angle accumulator for calculating the starting position of each raster line, for computing the position sweep of each raster line and for generating a blanking signal for said plan view display, and

time means generating timing and sequencing signals for generating each raster line.

4,228,433

INFORMATION DISPLAY POSITION-DEFINING CIRCUIT FOR A CATHODE RAY TUBE

Katsumi Matsumoto, Fukaya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 6, 1978, Ser. No. 967,154
Claims priority, application Japan, Dec. 15, 1977, 52/150928
Int. Cl.³ G06F 3/153
U.S. Cl. 340—748 **13 Claims**

1. An information display position-defining circuit for a cathode-ray tube comprising:

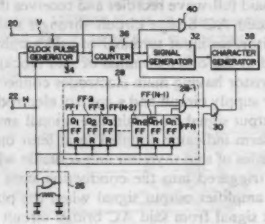
a local pulse oscillator producing an output pulse train in response to a horizontal synchronization pulse;

first signal-generating means for producing a horizontal position signal corresponding to an output signal from the local pulse oscillator;

second signal-generating means for generating a first signal having a prescribed phase relationship with the horizontal synchronization pulse during a first operation mode and for generating a second signal having a different phase from the first signal during a second operation mode;

operation mode-setting means connected to receive an output signal from said second signal generating means and a vertical synchronization pulse for producing an output signal to change over the operation mode of said second signal generating means when substantial synchronization arises between the output signal from said second signal generating means and the vertical synchronization pulse;

third signal-generating means for producing a vertical position signal in response to an output signal from the second signal-generating means; and



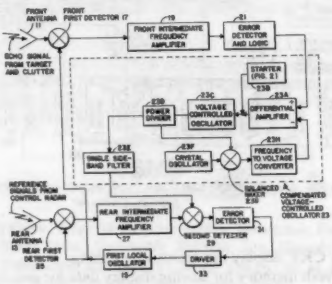
fourth signal-generating means for producing an information display position-specifying signal corresponding to the horizontal position signal and vertical position signal delivered from the first and third signal generators.

4,228,434

RADAR RECEIVER LOCAL OSCILLATOR CONTROL CIRCUIT

James Williamson, Franklin, and Paul G. Crete, Chelmsford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 5, 1978, Ser. No. 912,601
Int. Cl.³ G01S 13/00
U.S. Cl. 343—5 AF **3 Claims**



1. In a missile-borne radar receiver incorporating an intermediate frequency amplifier having a bandwidth narrower than the band of possible Doppler shift frequencies impressed on echo signals from targets, an improved arrangement producing a control signal for a local oscillator to cause the frequency of the local oscillator signal to vary, in accordance with the Doppler shift frequency of the echo signal from a selected target, so that a difference signal resulting from the heterodyning of the local oscillator signal and the echo signal falls within the pass band of the intermediate frequency amplifier, such arrangement comprising:

(a) a stable oscillator for producing a reference signal with a frequency representative of a frequency lower than the lowest one of the possible Doppler shift frequencies;

(b) a voltage-controlled oscillator for producing a control signal with a frequency within a band of frequencies encompassing the possible Doppler shift frequencies;

(c) a mixer, responsive to the reference signal and the control signal, for producing a difference signal with a frequency representative of the difference between the reference and control signals;

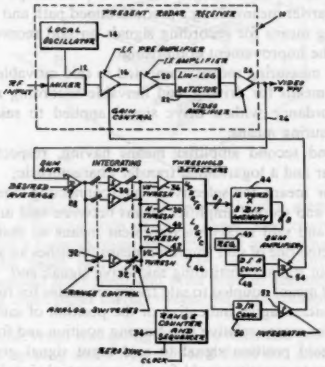
(d) oscillator frequency control means, responsive partially to the difference signal, for controlling the voltage-controlled oscillator first to set the frequency of the control signal therefrom at a frequency representative of a frequency higher than the highest possible Doppler shift frequency and then to decrease the frequency of such control signal until the frequency of the difference signal corresponds with the Doppler shift frequency of the echo signals from a target; and

(e) means for changing the frequency of the local oscillator in accordance with the frequency of the control signal out of the voltage-controlled oscillator.

4,228,435
RADAR SENSITIVITY TIME CONTROL USING RANGE GATED FEEDBACK

Robert L. Nevin, New Hartford, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 813,572, Jul. 7, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,885
Int. Cl.³ G01S *13/00*
U.S. Cl. 343—5 SM **2 Claims**

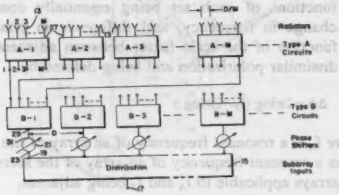


1. A sensitivity time control for radar receiving having signal processing means including, an input, a signal mixing means, an IF preamplifier and amplifier connected serially to the mixer, a logarithmic detector connected to the amplifier output and a video amplifier for processing the output of the logarithmic detector; the improvement comprising: means for monitoring and controlling the output of the video amplifier including a summing amplifier connected to the output of the video amplifier for producing a difference voltage; a plurality of integrating operational amplifiers connected to said amplifier; a plurality of first switches positioned between each integrating operational amplifier and the summing amplifier and a range counting means for sequentially operating said first switches in range related sequence, a plurality of threshold detectors connected to the output of the integrating operational amplifiers through a plurality of second switches operating in range related sequence, and a logic means connected to the output of said threshold detectors and operated in range related sequence and means for processing the output of said logic means for each range sweep whereby high threshold voltages will provide a decreased output and low threshold voltages will increase the voltage output, and means connecting the output of the processing means to the IF preamplifier of the radar receiver.

4,228,436
LIMITED SCAN PHASED ARRAY SYSTEM

Edward C. DuFort, Fullerton, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 3, 1978, Ser. No. 892,721
Int. Cl.² H01Q *3/26*
U.S. Cl. 343—854 **4 Claims**



1. A limited scan phased array system for scanning a narrow beam over a limited angular sector, comprising:

a predetermined number T antenna elements and a distribution network having a common input terminal and a predetermined number P distribution ports, where T and P are integers and M equals T/P which is equal to or greater than 3;

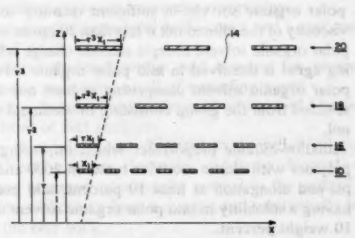
P phase shifters each connected at its input discretely from a corresponding one of said distribution ports; and

a lossless and passive sub-array interconnecting network having T output ports and P input ports, each of said output ports being connected discretely to a corresponding one of said antenna elements, and each of said input ports being connected discretely to the output of a corresponding one of said phase shifters, said lossless sub-array interconnecting network also including M first hybrid networks and M second hybrid networks, each of said first hybrid networks being a 1:M power divider having M output terminals and an input terminal connected discretely to one of said phase shifters, said predetermined number T antenna elements being equal to M times P.

4,228,437
WIDEBAND POLARIZATION-TRANSFORMING ELECTROMAGNETIC MIRROR

J. Paul Shelton, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 26, 1979, Ser. No. 52,298
Int. Cl.³ H01Q *15/24*
U.S. Cl. 343—909 **3 Claims**



1. A reflecting mirror for transforming the polarization of incident electromagnetic waves independently of the frequency of the waves and over an arbitrarily wide frequency bandwidth, comprising:

two interleaved sets of planar arrays of resonant elements, the two sets being orthogonally polarized,

the arrays of the first set being alternately layered with the arrays of the second set,

the layered elements of each set being spaced apart according to a logarithmic function,

each set having a reflection coefficient function which varies approximately linearly with the logarithm of frequency,

the difference in phase $\Delta\phi$ between the reflection coefficient functions of each set being essentially constant with change in frequency, said difference in phase being a function of the scale factor between adjacent arrays of dissimilar polarization and being defined by

$$\Delta\phi = 2\pi \log (f_x/f_y)/\log \tau$$

where f_x is a resonant frequency of an array of the first set,

f_y is a resonant frequency of an array of the second set, the arrays applicable to f_x and f_y being adjacent,

τ represents the scale factor between adjacent arrays of similar polarization,

and f_x/f_y represents the scale factor between adjacent arrays of dissimilar polarization.

4,228,438

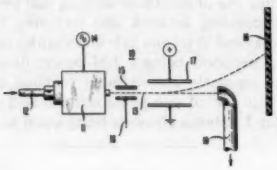
VIDEO JET PRINTER PROCESS WITH RADIATION CURED INK

Hargovind N. Vazirani, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 965,777, Dec. 4, 1978, abandoned, which is a continuation of Ser. No. 793,861, May 4, 1977, abandoned. This application Mar. 14, 1979, Ser. No. 20,532

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **30 Claims**



1. A process for jet video printing on a surface with diluted ink using a jet video printer in which printing takes place by forming a stream of ink droplets, some of which are charged electrically and electrostatically deflected onto the surface being printed, and the diluted ink is cured with radiation after printing CHARACTERIZED IN THAT the diluted ink comprises:

a. polar organic solvent in sufficient quantity so that the viscosity of the diluted ink is less than 20 cps in which said polar organic solvent accepts electric charge when ionizing agent is dissolved in said polar organic solvent, said polar organic solvent comprising at least one substance selected from the group consisting of methanol and ethanol,

b. radiation-curable prepolymer which on curing yields a polymer with elastic modulus between 2000 and 500,000 psi and elongation at least 10 percent, said prepolymer having a solubility in said polar organic solvent of at least 10 weight percent,

c. pigment in which 90 percent by weight of said pigment has agglomerate size less than 40 microns, said pigment present in amounts between 5 and 50 weight percent of the prepolymer,

d. ionizing agent which permits the diluted ink to accept electric charge present in amounts up to the weight of prepolymer.

4,228,439

LEVEL AND FREQUENCY MEASURING RECORDER

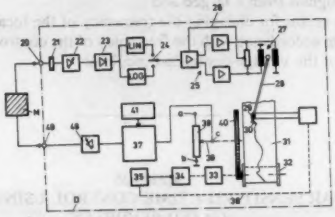
Bernhard Weingartner, Feldkirch, Austria, assignor to Neutrik Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 31, 1978, Ser. No. 938,638

Claims priority, application Austria, Sep. 5, 1977, 6350/77

Int. Cl.³ G01D *9/38*

U.S. Cl. 346—33 R **13 Claims**



1. In apparatus for recording output signals furnished by a unit under test in response to input signals applied thereto, said apparatus having means for generating input signals having a frequency varying as a function of a frequency control signal, means for applying said input signals to said unit under test, record carrier means, transport means for transporting said record carrier means along a predetermined path and movable recording means for recording signals on said record carrier means, the improvement comprising:

rotary measuring means connected to said movable recording means for driving said movable recording means in accordance with a drive signal applied to said rotary measuring means;

first and second amplifier means having, respectively, a linear and a logarithmic transfer characteristic;

selector means for selectively interconnecting one of said first and second amplifier means between said unit under test and said rotary measurement means so that the so-selected one of said amplifier means furnishes an amplified output signal constituting said drive signal; and

control means coupled to said transport means for furnishing a position signal indicative of the position of said record carrier means relative to a starting position and for applying said position signal to said input signal generating means to constitute said frequency control signal;

wherein said input signal generating means includes audio-frequency generator means; wherein said control means includes a potentiometer having a wiper arm and means for coupling the wiper arm to the transport means for movement therewith; and wherein said coupling means includes releasable coupling means.

4,228,440

INK JET PRINTING APPARATUS

Masanori Horike; Koichiro Jinnai; Kyuhachiro Iwasaki, and Yutaka Kodama, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,736

Claims priority, application Japan, Dec. 22, 1977, 52-154638

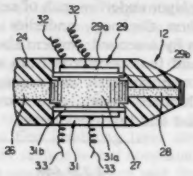
Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **7 Claims**

1. An ink jet printing apparatus including an ink ejection head and a plurality of capacitive ultrasonic vibrators disposed in the ink ejection head for atomizing ink flowing therethrough, characterized by comprising:

circuit means connecting the ultrasonic vibrators in parallel; an inductor connected to the ultrasonic vibrators to form a resonant circuit therewith; and

signal generator means for applying an alternating electrical signal to the resonant circuit, a frequency of the electrical signal being equal to a resonant frequency of the resonant circuit.

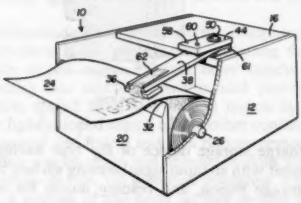


4,228,441

PRINTER HEAD BIASING APPARATUS

Samuel Rhine, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Filed Feb. 9, 1979, Ser. No. 10,557
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—139 C **10 Claims**



1. In a chart recorder where a print head is used to record data on a moving strip of chart paper, said chart recorder including a support frame and means for supporting the moving chart paper, said moving chart paper supporting means being spaced apart from said print head to accommodate the moving chart paper therebetween, the improvement comprising:

a cantilevered leaf spring having a fixed end provided with an opening and a free end, said fixed end anchored by a retainer means to said support frame;

said print head mounted on the free end of said leaf spring adjacent said paper supporting means;

said leaf spring for biasing the print head for maintaining constant pressure between the print head and the moving chart paper;

said retainer means comprising a plate overlying said fixed end of the leaf spring and having an opening aligned with the opening in said leaf spring; and a threaded fastener extending through said openings into said support frame.

4,228,442

MEANS FOR PREVENTING DRYING OF INK AT NOZZLES OF PRINT HEADS

Felix B. Krull, Leitershofen near Augsburg, Fed. Rep. of Germany, assignor to NCR Corporation, Dayton, Ohio

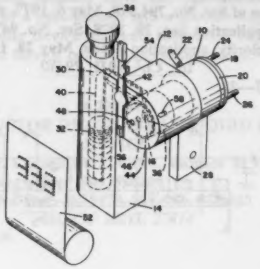
Filed Jan. 24, 1979, Ser. No. 6,312
Int. Cl.[3] G01D *15/18*
U.S. Cl. 346—140 R **15 Claims**

1. An ink jet print head having at least one nozzle through which pass droplets of ink onto a receiving medium,

means associated with said print head capable of holding a quantity of liquid ink solvent,

means adjacent said nozzle providing an area of atmosphere for a medium of gaseous nature, and

wick means having capillaric action properties and having a portion immersed in said liquid ink solvent and another portion extending from said liquid ink solvent to and around said nozzle in said area of atmosphere for carrying said solvent to said area enabling evaporation of said solvent in said area for providing an enriched atmosphere at said nozzle for maintaining the ink in a moist condition.

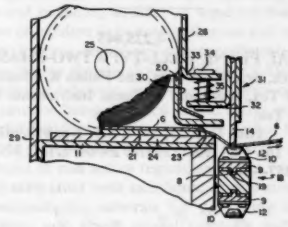


4,228,443

GRAPHIC ELECTRIC RECORDER

George C. Williams, South Easton, Mass., assignor to Alden Research Foundation, Brockton, Mass.

Filed Dec. 6, 1978, Ser. No. 966,811
Int. Cl.[3] G01D *15/06*
U.S. Cl. 346—165 **10 Claims**



1. A graphic electric recorder for marking an electrosensitive recording paper, said recorder comprising:

a housing including a base and a cover and a rear wall disposed on the base;

a platform disposed within said housing for receiving a cassette containing a roll of recording paper;

scanning electrode means disposed within said housing and in front of said platform;

linear electrode means disposed in operative relationship with said scanning electrode, said linear electrode means being arranged substantially normal to the path of paper being withdrawn from a cassette and substantially parallel to the rear wall;

feed roll means disposed in front of the electrodes, said feed roll means being disposed substantially parallel to the roll of recording paper and adapted to withdraw said paper from a cassette;

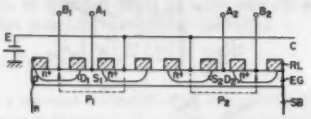
means on the housing for engaging a cassette to align the roll of recording paper substantially parallel to the linear electrode and for holding said linear electrode.

4,228,444

SEMICONDUCTOR DEVICE

Ryoiku Togei, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 794,518, May 6, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,050
Claims priority, application Japan, May 28, 1976, 51/62606
Int. Cl.[2] H01L *29/80*
U.S. Cl. 357—22 8 Claims



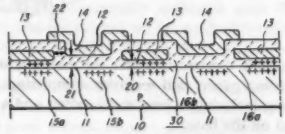
1. A semiconductor device comprising:
a semiconductor substrate of one conductivity type;
a semiconductor layer of the opposite conductivity type formed on the semiconductor substrate;
a source region and a drain region of the one conductivity type formed in the semiconductor layer of such depth therein as to be close to but not touching said semiconductor substrate so that junctions may be formed between them and the semiconductor layer, respectively, at such positions where a part of each of the depletion layers appearing around the source and drain regions during operation may easily reach the semiconductor substrate;
a local potential distribution generation electrode formed between the source and the drain regions to make an ohmic contact with the semiconductor layer; and,
the device characterized in that during operation a channel is set up between the source and drain regions with the depletion layers extending from the source and the drain regions to the semiconductor substrate within that portion of the semiconductor substrate where the depletion layers reach.

4,228,445

DUAL PLANE WELL-TYPE TWO-PHASE CCD

Al F. Tasch, Jr., Richardson, and Pallab K. Chatterjee, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1977, Ser. No. 845,982
Int. Cl.[3] H01L *29/78, 29/04;* G11C *19/28*
U.S. Cl. 357—24 8 Claims



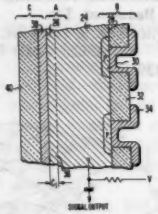
1. A charge-coupled device comprised of:
(a) a semiconductor substrate having dopant impurity atoms of a first type and a first surface;
(b) a charge-transfer channel in said substrate near said first surface;
(c) an insulating layer of non-uniform thickness on said first surface over said channel;
(d) a plurality of first electrodes spaced apart from each other and lying on said insulating layer transversely to said channel;
(e) a plurality of second electrodes lying on said insulating layer transversely to said channel in the spaces between said first electrodes;
(f) a well region of dopant impurity atoms of a second type opposite to said first type under each of said first and second electrodes; each of said well regions extending transversely across said channel and along said channel from one transverse edge of a respective one of said electrodes to a medial portion of said electrode; wherein said insulating layer underlies each of said first electrodes by a first uniform thickness, underlies each of said second electrodes by a second uniform thickness, and separates each of said first electrodes from adjacent second electrodes by approximately said second thickness, with said second thickness being approximately 20% to 60% greater than said first thickness.

4,228,446

REDUCED BLOOMING DEVICE HAVING ENHANCED QUANTUM EFFICIENCY

William M. Kramer, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 10, 1979, Ser. No. 37,832
Int. Cl.[3] H01L *27/14*
U.S. Cl. 357—31 7 Claims



2. In a charge storage device of the type having a single sensing element with an input signal sensing surface region and a charge storage region, and reading means for selectively contracting portions of said charge storage region, said sensing element including (a) a single crystal semiconductor wafer having a (1) plurality of discrete storage regions along a second surface, (2) a bulk region in said wafer, and (3) means for controlling blooming within said signal sensing surface region, and (b) a passivation layer for stabilizing the atomic energy level along a first surface of said wafer, the improvement comprising a coating on said passivation layer for improving the quantum efficiency of said device, said coating and said passivation layer in combination forming an anti-reflecting region having an optical thickness substantially equal to an odd multiple of a quarter of the wavelength of the light incident upon said device.

4,228,447

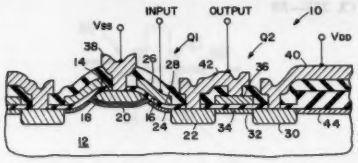
SUBMICRON CHANNEL LENGTH MOS INVERTER WITH DEPLETION-MODE LOAD TRANSISTOR

Shuichi Sato, Beaverton, and Tadanori Yamaguchi, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 12, 1979, Ser. No. 11,598
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—42 5 Claims

1. A monolithic metal-insulator-semiconductor inverter circuit structure of the combined enhancement/depletion-mode type, comprising:
a body of semiconductor material predominantly of one conductivity type, said body having a major surface that includes a substantially planar field and an adjoining nonplanar field with surface portions of relatively higher and lower elevation joined by a slope,
an enhancement-mode field effect device at least partially formed within said nonplanar surface field, said device including (a) a first, heavily doped region of the other conductivity type extending into said body at said higher surface portion, (b) a second, heavily doped region of said

other conductivity type extending into said body at said lower surface portion, said first and second regions respectively constituting source and drain regions for said enhancement-mode device, (c) a thin layer of said one conductivity type formed by implantation within said body beneath said first impurity region and including an upturned margin that terminates at said slope and constitutes a channel region for said device, (d) a third, more lightly doped region of said other conductivity type extending along said body surface between said channel region and drain region and constituting a drift region for said device, (e) a first insulating layer disposed over a portion of the body surface in said nonplanar field, including the portion extending between said first and second regions, and (f) a first gate electrode disposed on said first



insulating layer overlying said channel and drift regions, and

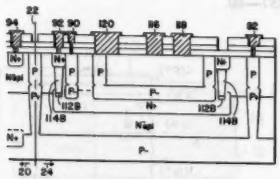
a depletion-mode field effect device integrated with said enhancement-mode device, and including (a) a fourth, heavily doped region of said other conductivity type extending into said body within said planar field at a location spaced from said second region by (b) a fifth, more lightly doped region of said other conductivity type, said second and fourth and fifth regions respectively constituting source, drain and channel regions for the depletion mode device, (c) a second insulating layer disposed over a portion of the body surface in said planar field, including the portion extending between said second and fourth regions, and (d) a second gate electrode disposed on said insulating layer overlying said fifth region.

4,228,448

BIPOLAR INTEGRATED SEMICONDUCTOR STRUCTURE INCLUDING I^2L AND LINEAR TYPE DEVICES AND FABRICATION METHODS THEREFOR

Thomas M. Lalumia, and James N. Fordemwalt, both of Tucson, Ariz., assignors to Burr Brown Research Corp., Tucson, Ariz.

Filed Oct. 7, 1977, Ser. No. 840,397
Int. Cl.³ H01L *27/02*
U.S. Cl. 357—46 **29 Claims**



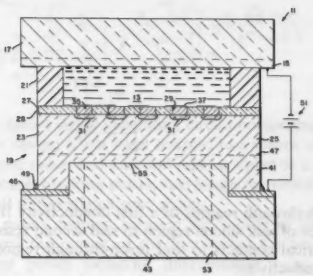
1. A bipolar integrated semiconductor structure comprising, in combination, a first portion having at least one linear type bipolar device having emitter, base and collector regions; a second portion separated in said structure from said first portion and having at least one I^2L type bipolar device having emitter, base and collector regions, said structure having a substrate, a first epitaxial layer located on said substrate, and a second epitaxial layer located on said first epitaxial layer, said linear type bipolar device having one of a subcollector and a subbase region located in a region encompassing a portion of the intersection between said substrate and said first epitaxial layer, said I^2L type bipolar device having a subemitter region located in a region encompassing a portion of the intersection between said first epitaxial layer and said second epitaxial layer, said one of a subcollector and a subbase region of said linear type bipolar device and said subemitter region of said I^2L type bipolar device being of the same conductivity type.

4,228,449

SEMICONDUCTOR DIODE ARRAY LIQUID CRYSTAL DEVICE

Paul O. Braatz, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 26, 1978, Ser. No. 973,513
Int. Cl.² H01L *27/14*
U.S. Cl. 357—30 **11 Claims**



1. A semiconductor diode array liquid crystal device for storage mode and infrared applications, comprising:

a liquid crystal structure having an inner surface;

a semiconductor substrate having an inner surface;

an insulating film disposed between and separating said inner surfaces and including an array of windows that are both reflective of incident light energy thereon and conductive of electric current, said semiconductor substrate including an active region therein along said inner surface of said semiconductor substrate, a separate minority carrier collecting junction being disposed in said active region adjacent each of said windows, said active region being now wider than the diffusion length of the minority carriers in the material of said active region; and

bias means associated with said liquid crystal structure and said semiconductor substrate for producing an electric field within said liquid crystal substrate and for back biasing said minority carrier collection junction.

4,228,450

BURIED HIGH SHEET RESISTANCE STRUCTURE FOR HIGH DENSITY INTEGRATED CIRCUITS WITH REACH THROUGH CONTACTS

Narasipur G. Anantha, Hopewell Junction, and Augustine W. Chang, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1977, Ser. No. 844,768
Int. Cl.² H01L *27/02*
U.S. Cl. 357—51 **12 Claims**

1. A high resistance structure for high density integrated circuits comprising:

a silicon region separated from other silicon regions by a dielectric barrier surrounding said region;

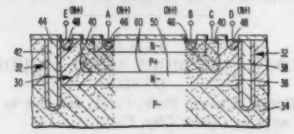
a first resistor of a first conductivity encompassing substantially the surface of said silicon region;

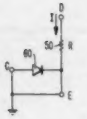
electrical contacts to said first resistor;

a region highly doped of a second conductivity located below said region of a first conductivity with reach-

through of said highly doped second conductivity to the surface of the said region of a second conductivity and electric contacts thereto for biasing purposes; and

a second resistor encompassing a region of said first conductivity located below said region of a second conductivity;





reach-through regions of a first conductivity from the surface of said silicon region to said second resistor; and

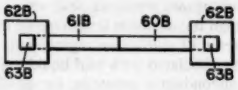
electrical contacts to said reach-through regions of a first conductivity.

4,228,451

HIGH RESISTIVITY SEMICONDUCTOR RESISTOR DEVICE

Ury Priel, Cupertino; Jerry D. Gray, San Jose, and Allen H. Frederick, Pacifica, all of Calif., assignors to Monolithic Memories, Inc., Sunnyvale, Calif.

Division of Ser. No. 805,534, Jun. 10, 1977, Pat. No. 4,152,627.
This application Jul. 21, 1978, Ser. No. 926,856
Int. Cl.[3] H01L *27/02, 29/78, 29/72;* H01C *1/012*
U.S. Cl. 357—51 **2 Claims**



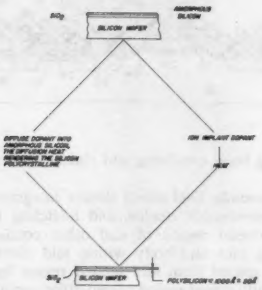
1. A high resistivity semiconductor resistor device comprising, in combination, a semiconductor region of one conductivity type, an insulating layer located on a surface of said semiconductor region, a shallow high resistivity region having a depth of no greater than about 0.5 microns located in said semiconductor region of one conductivity type and in contact with said insulating layer, said shallow high resistivity region having a higher resistivity than said semiconductor region of one conductivity type and containing impurities of opposite conductivity type, a pair of spaced semiconductor resistor contact regions having a depth greater than said shallow high resistivity region and having the same conductivity as said shallow high resistivity region located in contact with said semiconductor region of one conductivity type, said shallow high resistivity region being in electrical contact with each one of said pair of semiconductor resistor contact regions, and an electrical ohmic contact to each one of said pair of semiconductor resistor contact regions, said shallow high resistivity region being in direct semiconductor contact with only one of said pair of semiconductor resistor contact regions, an elongated connecting semiconductor region of the same conductivity type as said shallow high resistivity region in contact with said shallow high resistivity region and the other of said pair of semiconductor resistor contact regions, said connecting semiconductor region being of lower resistivity than said shallow high resistivity region, and long sides of said elongated connecting semiconductor region forming a PN junction with said semiconductor region of one conductivity type.

4,228,452

SILICON DEVICE WITH UNIFORMLY THICK POLYSILICON

David L. Losee, Fairport, and Alvin D. Wilder, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 797,971, May 18, 1977, Pat. No. 4,179,528.
This application May 2, 1979, Ser. No. 35,162
Int. Cl.[3] H01L *29/04*
U.S. Cl. 357—59 **1 Claim**



1. A semiconductor optical imaging device comprising:

(a) a chip of bulk silicon;

(b) a silicon dioxide coating on one surface of said chip; and

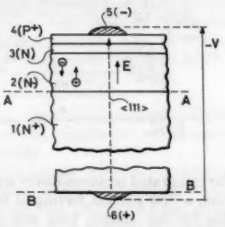
(c) doped vacuum deposited polysilicon having a reference thickness and overlaying said silicon dioxide coating, the thickness of said doped polysilicon being uniform, and variations in said uniformity being to within 20 A of said reference thickness for said doped polysilicon.

4,228,453

(III) PLANE GALLIUM ARSENIDE IMPATT DIODE

Thomas P. Pearsall, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jun. 16, 1978, Ser. No. 916,820
Claims priority, application France, Jun. 21, 1977, 77 18952
Int. Cl.[3] H01L *29/04, 29/20, 29/90*
U.S. Cl. 357—60 **3 Claims**



1. An avalanche diode structure including a semiconducting substrate, layers of gallium arsenide forming with said substrate a monocrystalline assembly and metallic deposits bordering said assembly and forming the electrodes of a diode, the surface separating the layers from one another and the surfaces of said electrodes being perpendicular to the axis <1 1 1> of

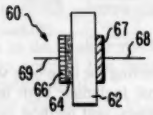
said monocrystalline assembly in such a way that the electrical field generated by a biasing voltage applied to the electrode is parallel to said axis <1 1 1> said diode comprising between said electrodes, an N^+-doped substrate, a first layer with N^--type doping, a second layer with N-type doping and a third layer with P^+-type doping.

4,228,454

HIGH TEMPERATURE CADMIUM BORACITE SEMICONDUCTOR DEVICE

Tatsuo Takahashi, Isehara, and Osamu Yamada, Tama, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 23, 1978, Ser. No. 880,484
Int. Cl.[2] H01L *29/24, 29/46*
U.S. Cl. 357—61 **11 Claims**



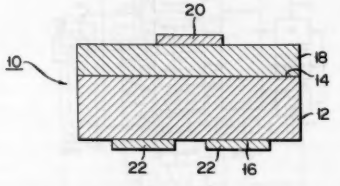
1. An electronic device comprising:
a body of cadmium boracite crystal having first and second surfaces, said body fabricated by chemical vapor transport;
first electrode means electrically contacting said first surface; and
second electrode means electrically contacting said first or second surface, wherein one of said electrodes contains silver and the other electrode is free of silver, said body and said electrodes exhibit a high electrical resistance state which is independent of applied alternating current or direct current voltage and a low electrical resistance state dependent upon applied alternating current or direct current voltage, said body and said electrodes change from said high electrical resistance state to said low electrical resistance state at a temperature of at least about 300° C.

4,228,455

GALLIUM PHOSPHIDE SEMICONDUCTOR DEVICE HAVING IMPROVED ELECTRODES

Nobuaki Yasuda, Zushi; Takenobu Ogawa, Kawasaki, and Tetsuo Sadamasa, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 29, 1978, Ser. No. 937,786
Claims priority, application Japan, Sep. 5, 1977, 52-105770
Int. Cl.[3] H01L *23/48, 29/46, 29/62*
U.S. Cl. 357—67 **10 Claims**



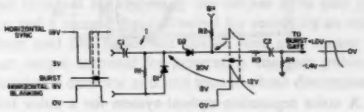
1. A gallium phosphide semiconductor device comprising:
an N type gallium phosphide monocrystal;
a semiconductor layer formed in or on the monocrystal; and
a pair of electrodes forming an ohmic contact, formed on a surface of the monocrystal and on a surface of the semiconductor layer, said electrode on the monocrystal surface being made of a film of a gold-germanium alloy containing germanium in a concentration ranging from the upper limit at which germanium forms a solid solution with gold at room temperature to the upper limit at which germanium forms a solid solution with gold at the eutectic temperature of the alloy.

4,228,456

BURST GATING SIGNAL GENERATING CIRCUIT

John D. Lovely, Batavia, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 33,582, Apr. 26, 1979, abandoned. This application Jun. 20, 1979, Ser. No. 50,372
Int. Cl.[3] H04N *9/46*
U.S. Cl. 358—20 **16 Claims**



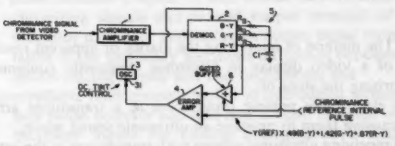
1. A burst gating signal generating circuit comprising:
first means having a first input coupled to a source of horizontal sync pulses and a second input coupled to a source of horizontal blanking pulses, said means for providing at its output differentiated sync pulses;
clamping means coupled between the source of blanking pulses and the output of the first means for providing combined pulses including differentiated sync pulses clamped and added to the horizontal blanking pulses;
a bias supply;
gating means coupled between the output of the first means and the bias supply for providing resultant pulses corresponding to those portions of the combined pulses having an amplitude greater than a predetermined amplitude related to the value of the bias supply, and
second means coupled between the gating means and the burst gate circuit for removing the DC component of the resultant pulses.

4,228,457

CONSTANT LUMINANCE TINT REFERENCE

Paul G. Wolfe, Batavia, N.Y., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jul. 11, 1979, Ser. No. 56,570
Int. Cl.[3] H04N *9/52*
U.S. Cl. 358—21 R **8 Claims**

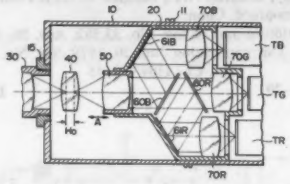


1. In a VIR-responsive tint control circuit that effects accurate phasing of the chrominance subcarrier oscillator by comparing one output of the chrominance demodulator during the chrominance reference portion of the VIR signal to a ZERO-COLOR reference signal indicative of an absence of color information, the improvement comprising:
dematrixing means for synthesizing from the chrominance demodulator outputs an appropriate ZERO-COLOR reference signal whereby only one sampling of the VIR signal need be taken in order to effect desired tint control.

4,228,458
OPTICAL COLOR-SEPARATION SYSTEM FOR USE IN A COLOR TELEVISION CAMERA

Toshiro Yamauchi, Omiya; Takemi Saito, Kawagoe, and Shigehiro Kanayama, Omiya, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed May 31, 1978, Ser. No. 911,174
Claims priority, application Japan, May 31, 1977, 52-63593
Int. Cl.³ H04N 9/09, 5/30
U.S. Cl. 358—55 3 Claims

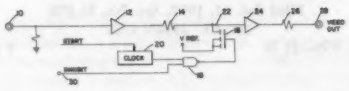


1. A color separation optical system for a color television camera of relay lens type wherein a set of color separating optical elements for separating light from a taking lens into red, green, and blue components of light by reflection and transmission are provided between a single first relay lens and three second relay lenses for the three colors, a removable field lens is provided between the taking lens and the first relay lens, and the light flux between the first relay lens and the second relay lenses is collimated, wherein the improvement comprises means for allowing axial movement of said single first relay lens with respect to the taking lens of the television camera, and means for axially moving said first relay lens, whereby the first relay lens is axially moved independently of the second relay lenses with respect to the taking lens of the camera to the position where the exit pupil of the taking lens if registered with the entrance pupil of the first relay lens.

4,228,459
ELECTRONIC BLACK MATRIX CIRCUITRY

Leland B. Smith, Englewood, Colo., assignor to Unirad Corporation, Englewood, Colo.

Filed Jan. 26, 1978, Ser. No. 872,542
Int. Cl.³ H04N 5/30, 5/14; A61B 10/00
U.S. Cl. 358—112 28 Claims



1. The method of improving the clarity or apparent resolution of a video display in ultrasonic diagnostic equipment comprising the steps of:

(a) electrically pulsing transducers in a transducer array causing them to produce an ultrasonic sound wave;

(b) receiving ultrasonic echoes with transducers in the array and converting the echoes to an electrical signal whose amplitude varies in time with the amplitude of the echoes;

(c) transforming the electrical signal into a video signal;

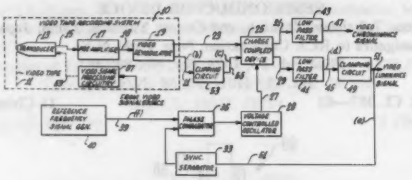
(d) periodically blacking out the video signal only when said video signal is not transmitting synchronization data; and

(e) displaying the video signal on a video monitor wherein unirradiated lines between adjoining video sweep lines and periodically blacked out portions in the video sweep lines coact to form a black matrix superimposed on the video display.

4,228,460
METHOD AND APPARATUS FOR COMPENSATION OF TIME BASE ERRORS

Gerhard Rotter, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,898
Int. Cl.³ H04N 5/76
U.S. Cl. 358—127 4 Claims



4. A method of correcting for time base variations in a video signal, said video signal including both information components and time base pulses, said method comprising the steps of:

increasing the amplitude of the time base pulses relative to the information components of the video signal;

clipping off a portion of each of the successive time base pulses, to remove any random noise superimposed thereon, the decrease in amplitude effected by said step of clipping corresponding generally to the increase in amplitude effected by said step of increasing;

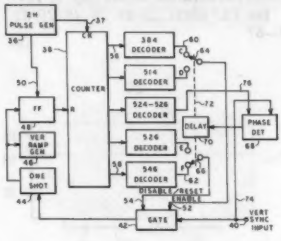
delaying the video signal by a variable amount to correct for the time base variations; and

clamping the time base pulses of the video signal to a fixed reference level, to produce a video signal substantially free of variations in its level caused by said step of delaying, and wherein, because of the previous step of clipping, the video signal produced is also substantially free of variations in its level that otherwise would have resulted from clamping a signal containing such noise.

4,228,461
VERTICAL SYNCHRONIZATION SYSTEM

William R. Weissmueller, Wildwood, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed May 25, 1979, Ser. No. 42,697
Int. Cl.² H04N 5/04
U.S. Cl. 358—148 14 Claims



1. In a vertical synchronization system for a television receiver receiving vertical sync pulses and having a local source of clock pulses whose frequency is a multiple of the nominal horizontal line frequency, a counter for counting the clock pulses, and means for enabling a vertical scan generator in response to the counter reaching a count representative of a nominal line rate/frame rate ratio coincidentally with receipt of a vertical sync pulse, the improvement comprising:

a first sync window generator, including means responsive

to the counter reaching a first count representative of a line rate/frame rate ratio less than nominal for generating a first window-open signal, and means responsive to the counter reaching a second count representative of a line rate/frame rate ratio greater than nominal for generating a first window-close signal, the interval between said first window-open signal and said first window-close signal defining a wide sync window;

a second sync window generator, including means responsive to the counter reaching a third count representative of a line rate/frame rate ratio less than nominal but closer to nominal than the first count for generating a second window-open signal, and means responsive to the counter reaching a fourth count representative of a line rate/frame rate ratio greater than nominal but closer to nominal than said second count for generating a second window-close signal, the interval between said second window-open signal and said second window-close signal defining a narrow sync window;

means responsive to the counter reaching a count approximately equal to nominal line rate/frame rate ratio for generating a control signal;

a sync transmission path adapted to receive selected, time-spaced, window-open and window-close signals and vertical sync pulses, and responsive to receipt of said pulses in an interval between the received window-open and window-close signals for coupling said pulses to the vertical scan generator to initiate vertical scan and to the counter for resetting thereof to an initial count;

mode control means for applying said first window-open and window-close signals to said transmission path, and responsive to time-coincidence between said control signal and a received vertical sync pulse for removing said first window-open and window-close signals from said transmission path and for applying said second window-open and window-close signals to said transmission path, such that dual mode operation is effected wherein sync pulses received during the wide sync window initiate vertical scan and reset the counter, after which only sync pulses received during the narrow sync window initiate vertical scan and reset the counter to thereby exclude noise occurring outside the range of the narrow sync window.

4,228,462

LINE OSCILLATOR SYNCHRONIZING CIRCUIT

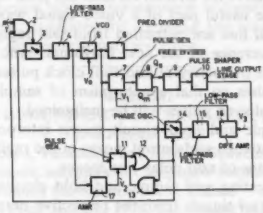
Jan van Straaten, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 14, 1978, Ser. No. 960,528

Claims priority, application Netherlands, Dec. 19, 1977, 7714033

Int. Cl.³ H04N 5/12; H03L 7/08

U.S. Cl. 358—158 **6 Claims**



1. A television receiver having a line deflection circuit and a line synchronizing circuit, said line synchronizing circuit comprising a controllable oscillator, a signal derived therefrom being applicable to said line deflection circuit; a pulse generator coupled to said oscillator for deriving pulse-shaped gate signals; a coincidence detector; means for applying said pulse-shaped gate signals and pulse-shaped line synchronizing signals to said coincidence detector; a first phase discriminator coupled to said coincidence detector for determining the phase difference between said line synchronizing signal and a reference signal derived from said oscillator signal; a first low-pass filter for smoothing the output voltage from said first phase discriminator, said controllable oscillator being coupled to said first low-pass filter whereby the output therefrom controls the frequency and/or phase of said controllable oscillator; a second phase discriminator for determining the interval between the center instant of a pulse of said pulse-shaped gate signal and the center instant of an edge occurring in said reference signal; a second low-pass filter for smoothing the output voltage from said second phase discriminator; and means for controlling the center instant of the edge in said reference signal using the output from said second low-pass filter; wherein said line synchronizing circuit further comprises gate means having a first input terminal for receiving the output from said pulse generator and a second input terminal for receiving an output signal from said line deflection circuit, said gate means also having an output terminal for generating the gate pulses for said coincidence detector and said second phase discriminator.

4,228,463

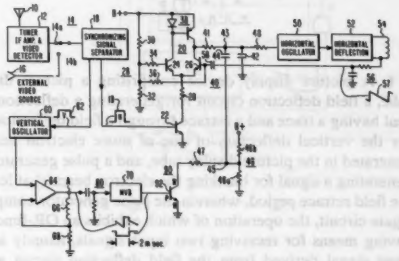
SWITCHED AFPC LOOP FILTER WITH OFFSET VOLTAGE CANCELLATION

Steven A. Steckler, Clark, and Alvin K. Balaban, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 17, 1979, Ser. No. 39,883

Int. Cl.³ H04N 5/05; H03B 3/04

U.S. Cl. 358—158 **12 Claims**



1. A television horizontal oscillator phase control loop arrangement, comprising:

a source of horizontal synchronizing signals;

controllable oscillator means including a rate control input terminal and an output terminal at which oscillators are generated;

a phase detector coupled to said source of horizontal synchronizing signals and to said output terminal of said oscillator means for generating an output signal representative of the frequency and phase difference between said synchronizing signals and said oscillations; and

controllable filter means coupled to said output terminal of said phase detector and said rate control terminal of said oscillator means for closing a degenerative feedback AFPC loop for filtering said output signal to form an oscillator control voltage for synchronizing said oscillator with said synchronizing signals, said controllable filter means further comprising controllable impedance means by which the time constant of said filter is periodically changed, said controllable impedance means introducing during a portion of its operating time a first voltage offset which perturbs said control voltge and therefore said synchronization; wherein the improvement comprises:

means for introducing a second offset voltage of magnitude equal to that of said first voltage offset for maintaining said

control voltage constant thereby reducing said perturbation.

4,228,464

PICTURE DISPLAY DEVICE COMPRISING A FIELD DEFLECTION CIRCUIT AND A FIELD BLANKING CIRCUIT

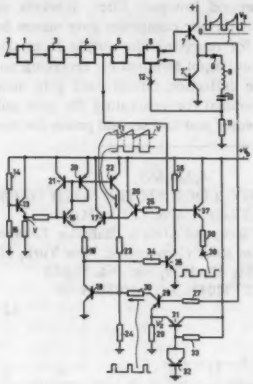
Peter A. Duijkers, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,607

Claims priority, application Netherlands, Feb. 6, 1978, 7801315

Int. Cl.³ H04N 3/24

U.S. Cl. 358—165 **5 Claims**



1. A picture display device comprising a picture display tube, a field deflection circuit for generating a deflection current having a trace and a retrace through a field deflection coil for the vertical deflection of one of more electron beam(s) generated in the picture display tube, and a pulse generator for generating a signal for blanking the electron beam(s) at least in the field retrace period, wherein the pulse generator comprises a gate circuit, the operation of which exhibits an OR-function, having means for receiving two input signals, namely a first input signal derived from the field deflection circuit and a second input signal derived from the field deflection coil, the gate circuit producing the blanking signal for the electron beam(s).

4,228,465

ANALOG VIDEO CONVOLVER FOR REAL TIME TWO-DIMENSIONAL IMAGE PROCESSING

Barry N. Stone, Waukesha, and Thomas W. Lambert, Dousman, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,281

Int. Cl.³ H04N 5/14, 5/21, 5/32

U.S. Cl. 358—166 **5 Claims**

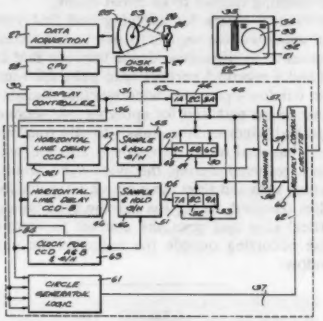
2. A real time two-dimensional analog video convolver for modifying picture element (pixel) signals in a system including a video monitor for displaying a picture composed of successive horizontal lines of pixels, said monitor having composite video signal input means, said system further including display controller means for storing pixel signals representative of a picture to be displayed and operative to convert said pixel signals to analog video signals for successive horizontal lines, said controller being operative to provide the composite video waveform signals including synchronizing signals for controlling the monitor and to provide pixel clock pulses to enable reading out the stored pixel signals in phase with their display by the monitor, said controller having output means for said composite video signal; said convolver comprising:

a series of shift register means each having a predetermined number of stages and each having input and output means, the input means of the first register in the series being for coupling to the output means of said display controller, the output means of each register being coupled to the input means of said next register in the series,

means synchronized by said clock pulses for supplying sample clock pulses and shift clock pulses to said shift register means, said register means responding to said sample clock pulses by taking a series of successive samples of the voltage of said video signal waveform for a horizontal line and responding to said shift clock pulses by transporting said samples through the stages of said register,

said series of samples from the first register being clocked repeatedly to the next register to enable the first register to obtain the next series of samples in phase with the samples in the next register, the series of samples in each said next register thereby being increasing delayed with respect to a preceding register for the time of a video signal series and the samples in said first register being delayed for the time of one video signal series relative to the next video signal waveform which will occur in real time,

a plurality of delay line means each of which is comprised of delay elements and each having input and output means, the input means of said first delay line means being coupled to the output means of said display controller and the input means of others of said plurality of delay line means being coupled to the output means of said registers, respectively,



the number of stages in each of said shift registers exceeding by the same amount the number of pixels that are required to fill a horizontal line across the display screen of said video monitor, and including

means operative for an interval after the pixel signals constituting the useful part of a video signal waveform for a horizontal line are outputted from said registers and before occurrence of the next horizontal sync pulse to increase the frequency of said shift clock pulses and sample clock pulses so that synchronism of sampling and the horizontal sync pulses will be maintained,

plural sample and hold circuit means interposed, respectively, between said output means of the registers and the input means of said delay line means,

means for gating said sample and hold circuits to transfer sample pixel signals from the respective output means of said registers to the delay line means to which they are coupled only between pixel clock and analog shift pulses,

said delay line means each being operative to delay incoming pixel signals for periods of one or more pixels so that there will appear simultaneously at respective delay line output means delayed pixel signals from each horizontal line, said delayed pixel signals being maintained in a predetermined time relationship with each other,

means for summing the majority of pixel signals appearing at any instant in said delay line output means,

means for optionally varying the magnitudes of said summed signals either negatively or positively,

means for summing said summed signals with a selected one of the pixel signals from one of the delay elements to modify said one signal, and

means for coupling the modified signal to said video signal input of the monitor.

4,228,466

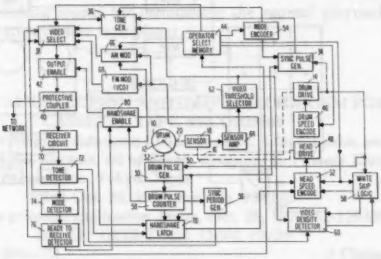
TRANSMISSION MODE SIGNALING BETWEEN A FACSIMILE TRANSMITTER AND A FACSIMILE RECEIVER

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 617,104, Sep. 26, 1975, Pat. No. 4,079,425. This application Mar. 13, 1978, Ser. No. 886,147

Int. Cl.[2] H04N *1/36*

U.S. Cl. 358—257 **37 Claims**



1. A facsimile unit for transmitting signals representing dark-light variations in a document to a remote location:

sensor means for sensing dark-light variations in a document in two substantially orthogonal directions;

scanning means for scanning said sensor means relative to the document;

sync generator means coupled to said scanning means for generating synchronizing signals comprising a series of pulses representing the predetermined relative position between said scanning means and said sensor means;

modulator means coupled to said sensor means and said sync generator means for generating modulated transmission signals representing dark-light variations in the document and said synchronizing signals; and

mode signaling means associated with said sync generator means for selecting and controlling the time lapse between pulses in said synchronizing signals in response to the selection of a transmission mode during an initial synchronizing period prior to transmission of signals representing dark-light variations for signaling the scanning rates in both of said orthogonal directions.

4,228,467

REDUCED REDUNDANCY FACSIMILE TRANSMISSION INSTALLATION

Martin de Loye, Versailles, and Michel Beduchaud, Palaiseau, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jun. 20, 1978, Ser. No. 917,428

Claims priority, application France, Jun. 30, 1977, 77 20078

Int. Cl.[3] H04N *7/12*

U.S. Cl. 358—261 **4 Claims**

1. An installation for transmitting a facsimile signal of a document with reduced redundancy in transmission; the installation comprising a transmitter equipment and a receiver equipment; wherein the transmitter equipment comprises:

document analysis means for scanning a document in successive scan lines and delivering binary analysis data DA representative of the scan lines;

conversion means connected to receive the analysis data and to derive run length words therefrom representative of the number of consecutive bits of the same level in each scan line of the analysis data;

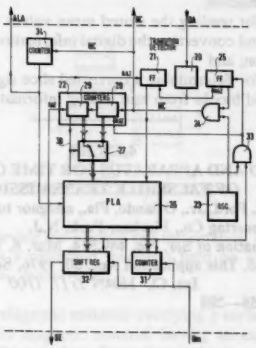
a first array of combinatorial logic circuits connected to receive the run length words and to transcode them into other binary code words which constitute transmission data DE;

the transmission data DE being encoded using a truncated Huffman code to provide both terminal code words and composition code words, where terminal code words accurately define the lengths of runs which are shorter than a defined limit, and where composition code words coarsely define, in terms of sections, the lengths of runs which are not shorter than the defined limit, such a run length being accurately defined by assigning both a composition code word and a terminal code word thereto; and

transmission means for applying said transmission data DE in the form of a facsimile signal to a transmission medium;

and wherein the receiver equipment comprises:

means for receiving the facsimile signal transmitted by the



transmitter equipment and deriving therefrom binary reception data DR corresponding to the transmission data DE which gave rise to the received facsimile signal;

a second array of combinatorial logic circuits connected to receive the reception data DR, to recognise the terminal code words and the composition code words therein, and to transcode these code words into run length words;

restitution means responsive to the run length words to restore the analysis data;

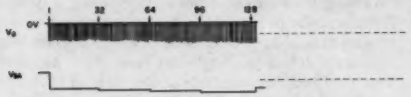
a printer responsive to the analysis data to reproduce the analysed document; and

wherein said first array of combinatorial logic circuits is associated with a presettable counter and an output register for parallel to serial conversion of the transmission code data DE, both the counter and the output register being connected to load data in parallel form from the array when the counter is in its zero state, the output register being connected to receive a code word of the transmission data from the array and to deliver it in serial form to the transmission means at a transmission clock rate Hm, and the presettable counter being connected to be preset by the array to the length of the corresponding code word and to count down to the zero state at the transmission clock rate Hm.

4,228,468
OUTPUT CORRECTING SYSTEM FOR FACSIMILE

Humikazu Nagano, Nara; Hiromu Sasaki, Yamatokoriyama, and Syoichi Yasuda, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 22, 1978, Ser. No. 935,852
Claims priority, application Japan, Aug. 30, 1977, 52/105554
Int. Cl.[2] H04N *1/40*
U.S. Cl. 358—280 7 Claims

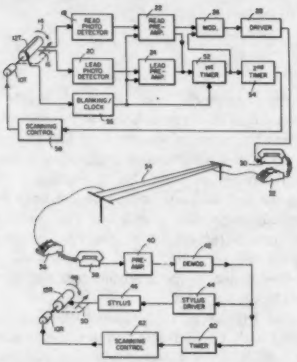


1. An optical image reading apparatus comprising:
a solid state image sensor for scanning a plurality of data blocks arranged in slices;
means for generating video signals corresponding to an image to be read by said solid state image sensor;
means for determining respective mean values of the video signals corresponding to each of said data blocks;
means for storing the mean values in a memory as digital information;
means for reading the stored mean values out of said memory and converting the digital information to analog information; and
means for determining a corrected slice signal level in each of said blocks from said analog information.

4,228,469
METHOD AND APPARATUS FOR TIME COMPRESSION OF FACSIMILE TRANSMISSIONS

Herbert P. Ford, Jr., Orlando, Fla., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 449,514, Mar. 8, 1974, Pat. No. 3,955,045. This application Apr. 30, 1976, Ser. No. 682,025
Int. Cl.[2] H04N *1/17, 1/00*
U.S. Cl. 358—288 2 Claims

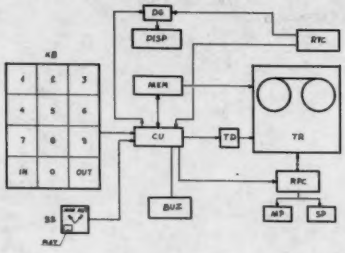


1. A facsimile receiver for receiving signals representing dark-light variations in a document at a remote location, said receiver comprising:
writing means for marking a copy medium;
signal receiving means coupled to said writing means for generating information signals for actuating said writing means to mark said copy medium when signals representing dark regions are received;
receiver scanning means for moving said document relative to said writing means in two substantially orthogonal directions at a slow scanning rate and a fast scanning rate; and
receiver scanning control means coupled to said signal receiving means and responsive to the video density of said information signals for actuating said writing means for automatically initiating said fast scanning rate in both said directions when said information signals represent low video density and initiating said slow scanning rate in both said directions when said information signals represent high video density.

4,228,470
ELECTRONIC REMINDER SYSTEM

Raphael Rahamin, Rasco G-9, and Gabriel Cabelli, Rasco G-13, both of Hod Hasharon, Israel

Filed Oct. 26, 1978, Ser. No. 954,987
Int. Cl.[3] G11B *5/00*
U.S. Cl. 360—12 14 Claims



1. An electronic reminder system, comprising: means for receiving a record medium on which a plurality of different spoken messages are each to be recorded and to be played-back at a specified day, hour and minute point-of-time for each message; a microphone for recording the spoken messages; manual time selector means for inputting the specified day, hour and minute point-of-time at which the respective spoken message is to be played-back; a real-time clock for measuring time in a real-time manner and for producing an output corresponding to such real-time measurement; control means controlled by the output of said clock for signalling automatically the arrival of each specified point-of-time at which a recorded spoken message is to be played-back; play-back means including a speaker for effecting the play-back of such spoken messages; and a "Play" key for effecting the play-back of the respective recorded message after its specified point-of-time has arrived.

4,228,471
APPARATUS FOR SEARCHING A PIECE OF INFORMATION RECORDED ON A MAGNETIC TAPE

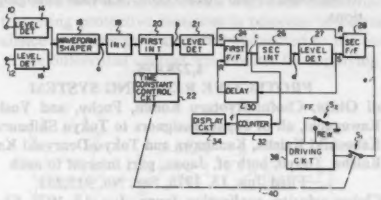
Takashi Shiga, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 4, 1978, Ser. No. 966,375
Claims priority, application Japan, Dec. 5, 1977, 52/145840
Int. Cl.[2] G11B *15/48, 15/18*
U.S. Cl. 360—73 14 Claims

1. An apparatus for searching for a piece of information prerecorded on a magnetic tape, the information being reproduced by a tape player including a tape drive mechanism and reproducing means, said apparatus comprising;
(a) means responsive to signals reproduced from the magnetic tape for deriving first and second signals respectively indicative of initial and end portions of each piece of information;
(b) delay means responsive to the first signal for delaying said first signal by a predetermined interval;
(c) means for assuming a first stable state in response to the

output signal of said delay means and a second stable state in response to said second signal;

(d) means for changing the reeling speed of said tape player from a normal playback speed to a high speed in response to said first stable state of said third mentioned means, and



from said high speed to said normal playback speed in response to said second stable state of said third mentioned means; and

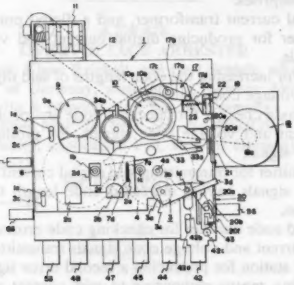
(e) switching means for maintaining the normal playback operation of said tape player.

4,228,472

INTERVAL DETECTION AND DRIVE MECHANISM FOR CASSETTE TAPE RECORDER

Yoshihiro Magata, Kawagoe; Kobun Yoshida, Kamifukuoka, and Itsuo Kato, Sayama, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 26, 1978, Ser. No. 954,883
Claims priority, application Japan, Oct. 28, 1977, 52-129350
Int. Cl.[2] G11B *27/22, 15/44, 19/26*
U.S. Cl. 360—73 **3 Claims**



1. An interval detection and drive mechanism for a cassette tape recorder including playback, fast forward and rewind levers on a chassis, which comprises

electrical circuit means for detecting an interval between recorded tunes on the tape and generating a detection signal upon the detection of said interval,

switching means for actuating said detecting circuit means,

tape drive control means shiftable between a fast forward or rewind state and a playback state, wherein said drive control means includes an eccentric cam disc adapted to be rotated a half turn in response to said detection signal, and a head carriage slidably mounted on the chassis and shiftable between a recording/playback position and another position, said head carriage being operatively connected to said cam disc so that the head carriage is shifted from the other position to the recording/playback position as a result of the half turn of said cam disc,

a lock plate operatively coupled to the switching means and to the playback, fast forward and rewind levers, said lock plate locking the fast forward and rewind levers when the switching means is operated and releasing the fast forward and rewind levers when the playback lever is moved to the playback position, and

moving means operatively connected to said control means for moving and maintaining the playback lever to the playback position,

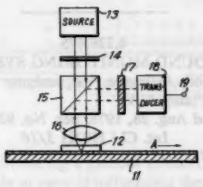
wherein when said switching means is operated to actuate the detecting circuit means during the fast forward or rewind operation, said detecting circuit means detects the first interval between tunes after the actuation to deliver the detection signal to said control means and to the moving means, thereby changing the control means from the fast forward or rewind state to the playback state and moving the playback lever to the playback position.

4,228,473

PICK-UP DEVICE FOR MAGNETICALLY RECORDED INFORMATION AND METHOD AND SYSTEM FOR USING SAME

Masami Himuro, Tokyo; Toshiro Yamada, Kamakura, and Yoshimi Makino, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 19, 1978, Ser. No. 952,663
Claims priority, application Japan, Oct. 20, 1977, 52-126193
Int. Cl.[2] G11B *5/32, 7/02;* G11C *11/14, 11/42*
U.S. Cl. 360—114 **28 Claims**



1. A pick-up device for reading out information which has been recorded as a patterned magnetic field on a magnetic recording medium, comprising:

a substrate;

a layer of soft magnetic material overlying a surface of said substrate, said magnetic material having an easy axis of magnetization normal to said surface and being of the type of magnetic material in which magnetic bubble domains can be generated and propagated in the presence of a bias magnetic field, and in which magnetic domains align themselves in a maze pattern in the absence of an applied magnetic field, said magnetic material having a magnetic wall coercivity which is sufficiently low so that, in the absence of said patterned magnetic field, said magnetic domains align themselves in said maze pattern, and, in the presenc of said patterned magnetic field, said maze pattern easily changes to a signal pattern corresponding to that of said patterned magnetic field so as to read the information that has been recorded on said magnetic recording medium;

and means for sensing said signal pattern and providing a corresponding electrical output.

4,228,474

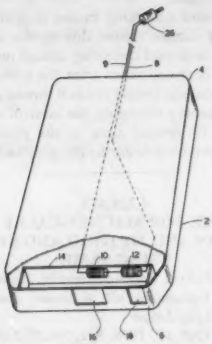
ADAPTER UNIT FOR TRANSLATING ELECTRICAL SIGNALS

Roy L. Neal, Jr., RFD 1, Box 56C Montreal, Mo. 65591

Filed Nov. 13, 1978, Ser. No. 959,887
Int. Cl.[3] G11B *31/00, 23/00*
U.S. Cl. 360—137 **1 Claim**

1. An adapter unit for playing remotely located electronic apparatus through a magnetic tape player having a pick-up head, said adapter unit consisting essentially of: a housing; input connecting means extending through said housing to disengageably connect to the output of said remotely located

electronic apparatus; at least two stationarily and fixedly mounted magnetic field producing coils in spaced series relation disposed within said housing positioned to provide a magnetic field in the vicinity of said pick-up head of a magnetic



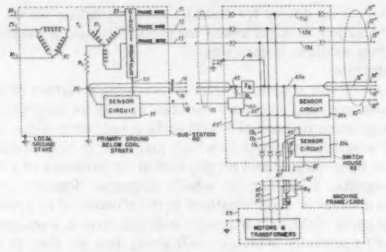
tape player, said magnetic field producing coils being spaced from said pick-up head when in operation; and, said connecting means and said magnetic field producing coils being in electrical communication.

4,228,475

GROUND MONITORING SYSTEM

John R. Sherwood, Arlington, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,680
Int. Cl.[2] H02H *3/16*
U.S. Cl. 361—47 **18 Claims**



1. In a ground wire sensor circuit for use with an electrical power cable that includes power conductors, at least one ground wire and at least one other wire that is not a power conductor, wherein said ground wire and other wire are joined together at one end of the power cable by a resistance means of given value, and wherein a sensing signal is coupled between the other ends of the ground and other wires to form a ground wire monitoring loop, said sensing signal being at a sensing frequency that is substantially different from that of the electrical power to be carried on the power conductors, and wherein the cable is connected to a source of power through circuit interrupting means,

the method of testing the electrical condition of said loop, comprising the steps

substantially blocking the sensing signal from leaving the loop at a region on the ground wire that is adjacent said resistance means,

sampling the sensing signal voltage on said loop and producing a sampled voltage signal in response thereto,

sampling the sensing signal current in said loop and producing a sampled current signal in response thereto,

comparing the sampled voltage and current signals and producing a comparison output signal when a predetermined relationship exists between the compared signals,

changing the condition of a circuit control means in response to the production of a comparison output signal,

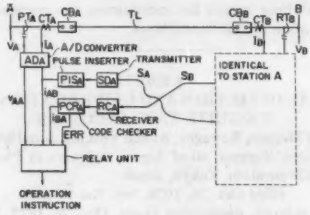
opening said circuit interrupting means to disconnect the power conductors of said cable from said source of power to response to said circuit control means changing conditions.

4,228,476

PROTECTIVE RELAYING SYSTEM

Yuji Okita, Chofu; Ryotaro Kondo, Fuchu, and Yoshiji Nii, Kawaguchi, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa and Tokyo Denryoki Kabushiki Kaisha, Tokyo, both of, Japan, part interest to each

Filed Jun. 13, 1978, Ser. No. 915,231
Claims priority, application Japan, Jun. 13, 1977, 52-68942
Int. Cl.[2] H02H *3/28, 7/26*
U.S. Cl. 361—68 **7 Claims**



5. A protective relaying system of an electric power transmission line between first and second stations, wherein each station comprises:

a digital current transformer, and a digital potential transformer for producing digital current and voltage code signals,

means for increasing the code lengths of said digital current and voltage code signals,

a first code checker for checking code errors of said digital current and voltage code signals, for producing a first error signal,

a transmitter for transmitting said digital current and voltage code signals having increased code length to the other station,

a second code checker for checking code errors of the digital current and voltage code signals transmitted from the other station for producing a second error signal,

processing means responsive to said current and voltage signals for producing an operation instruction, and means responsive to said first and second error signals for controlling said processing means.

4,228,477

CIRCUIT FOR MONITORING THE CURRENT DISTRIBUTION IN PARALLEL-CONNECTED CONVERTED BRANCHES

Achim Claus; Heinrick Geissing, and Willi Ulbrich, all of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 31, 1979, Ser. No. 8,040
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1978, 2807095
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—87 **10 Claims**

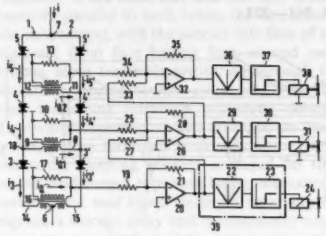
1. A circuit arrangement for monitoring current in two parallel-connected converter branches each of which comprises at least two series-connected converter valves comprising:

a differential current transformer for measuring the differ-

ence between the levels of currents flowing in the two branches at a junction point of the branches,

cross-connections, each containing the primary winding of a current transformer, for connecting the anodes and cathodes of corresponding converter valves in both branches, and

threshold detection means associated with each transformer for triggering protective measures in response to current imbalance comprising an amplifier connected to the output of the differential current transformer for supplying a



signal to a threshold detector and a summing amplifier in each cross-connection for supplying a signal to a threshold detector,

the summing amplifier having one summing input connected to the current transformer and another summing input connected to the output of the respective preceding amplifier,

the gains of the circuits containing the amplifier and the summing amplifiers being in the ratio of 0.5 to 1, respectively.

4,228,478

OVERVOLTAGE ARRESTER

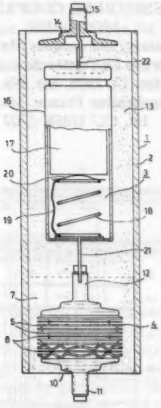
Werner Jakszt; Klaus Reichelt, and Gert Schiele, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,921

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 7711213[U]

Int. Cl.[2] H02H *9/06*

U.S. Cl. 361—128 **3 Claims**



1. An overvoltage arrester for use in protecting machines and transformers comprising:

an insulating housing;

a voltage dependent resistor in said housing;

a first connecting device connected to said resistor and having a protruding portion which extends out of said housing;

a spark gap, formed as a separate unit, disposed in said housing, and having an outer diameter which corresponds to the inner diameter of the housing, said spark gap comprising a body of hardened cast resin in which a plurality of electrodes, a plurality of spacer washers arranged between said electrodes, and another connecting device are embedded; and

a body of resin cast in said housing and on said spark gap in which said resistor body of a portion of said first connecting device are embedded.

4,228,479

DEVICE FOR THE PRODUCTION OF A GASEOUS STREAM CARRYING ELECTRIC CHARGES

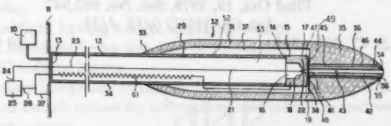
Serge Larigaldie, Chatenay-Malabry, and Jean Cariou, Chatillon, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Filed Mar. 5, 1979, Ser. No. 17,090

Claims priority, application France, Mar. 10, 1978, 78 07067

Int. Cl.[2] H01G *1/08*; H05F *3/00*

U.S. Cl. 361—218 **12 Claims**



1. A device for producing a gaseous stream carrying electric charges, particularly in view of influencing the electric voltage of a body, particularly of an airship such as a helicopter, comprising a metallic needle connected to a first pole of a high voltage electric source and having a point which is arranged in the neck of a metallic nozzle supplied with a source of compressed air to create a stream carrying the electric charges, the nozzle being arranged at one end of an electrically insulating hollow duct means for ejecting the stream towards the atmosphere, the ejection opening of the stream being surrounded by a massive hood made of an electrically insulating material.

4,228,480

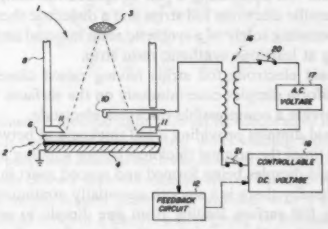
ELECTROPHOTOGRAPHIC APPARATUS WITH IMPROVED CORONA CHARGING

Bruce R. Benwood, Spencerport, and Paul A. LaChapelle, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,606

Int. Cl.[3] H01T *19/04*

U.S. Cl. 361—235 **10 Claims**



1. In electrophotographic apparatus of the type having a charging station for applying a primary charge of nominal

potential level to the imaging surface of a stationary photoconductor, an improved charging device comprising:

(a) corona discharge means for generating electrostatic charge when energized;

(b) energizing means including a source of variably-biasable AC potential coupled to said corona discharge means; and

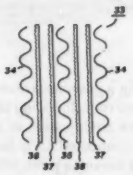
(c) control means for varying the bias of said energizing means, during a period of primary charging, from a level substantially above said nominal potential level toward said nominal potential level.

4,228,481

CAPACITOR WITH EMBOSSED FOIL ELECTRODE

Nicola G. DiNicola; Robert V. Pastir, and William J. Wright, all of Glen Falls, N.Y., assignors to General Electric Company, Hudson Falls, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,947
Int. Cl.³ H01G *0/15, 4/22*
U.S. Cl. 361—314 **10 Claims**



1. An electrical capacitor grade aluminum foil comprising a soft annealed aluminum foil strip having a plurality of individual curvilinear surfaced dimple-like projections and depressions from the plane of the foil, said projections and depressions being coterminous with the length and breadth of the useful foil surface in an electrical capacitor, said dimples being formed and spaced apart in a manner whereby there is a smooth essentially continuously curving foil surface leading from one dimple to an adjacent projection so that a point on the base of one dimple projection and a point on the adjacent base of a dimple depression are essentially coincident.

9. In an electrical capacitor including a casing with electrical terminals thereon and one or more capacitor rolls in said casing and connected to the terminals and a dielectric fluid in the casing and impregnating the roll, the combination of

(a) said roll comprising a pair of spaced full dimple pattern metallic electrode foil strips and a dielectric therebetween consisting solely of a synthetic resin material and comprising at least one synthetic resin strip,

(b) said electrode foil strips having raised closely spaced uniform dimples coterminously on the surfaces thereof to provide a compressible thickness electrode,

(c) said dimples providing a foil thickness of between 2 and 10 times the original thickness before winding in said roll,

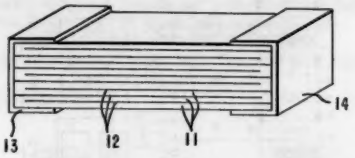
(d) said dimples being formed and spaced apart in a manner whereby there is a smooth essentially continuously curving foil surface leading from one dimple to an adjacent dimple so that a point on the base of one dimple and a point on the base of an adjacent dimple are essentially coincident.

4,228,482

MULTILAYER CERAMIC CAPACITORS

Robert J. Bouchard, Wilmington, Del.; Lothar H. Brixner, West Chester, Pa., and Michael J. Popowich, Lewistown, N.Y., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 757,097, Jan. 5, 1977, abandoned, which is a continuation of Ser. No. 594,281, Jul. 9, 1975, abandoned. This application Dec. 13, 1977, Ser. No. 860,211
Claims priority, application Canada, Jul. 7, 1976, 256456
Int. Cl.² H01B *3/12*
U.S. Cl. 361—321 **10 Claims**



1. A monolithic ceramic capacitor comprising a plurality of superimposed alternating layers of a dielectric composition and metal electrodes bonded together into a unitary body, the capacitor having a dielectric constant of at least 1000 and a dissipation factor of less than 5% and exhibiting a change in capacitance, at room temperature with time of about 1.5% or less per decade in hours even at a dielectric constant of 4000, the capacitor having been fired at a low temperature of 1050° C. or less in air, the electrodes being substantially embedded in the dielectric and having a melting point less than about 1050° C., the dielectric composition having the formula

$$(Sr_xPb_{1-x}TiO_3)_a(PbMg_{0.5}W_{0.5}O_3)_b$$

wherein

x is 0–0.10,

a is 0.35–0.5,

b is 0.5–0.65, and

a plus b equals one

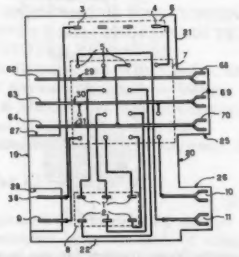
and the metal electrodes comprise silver.

4,228,483

SEQUENTIAL CONTROL ELECTRICAL CHAIN COMPRISING ASSEMBLED COUPLING CONNECTOR MODULES

André Haury, Le Raincy, and Jacques Marcenne, Poitiers, both of France, assignors to La Telemechanique Electrique, France

Filed Mar. 14, 1978, Ser. No. 886,507
Claims priority, application France, Mar. 14, 1977, 77 07532
Int. Cl.² H05K *5/02*
U.S. Cl. 361—393 **5 Claims**



1. A sequential automatic control device for controlling

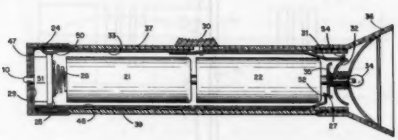
electrical apparatuses which provide feedback signals upon completion of an operation, said control device comprising a plurality of mechanically coupled and electrically interconnected modules, electrical circuit means providing electrical supply and resetting signals to the modules; sequence circuit means connecting each module to each adjacent module and adapted to transmit setting signals from each module to the next module and resetting signals from each module to the preceding module, each module consisting of an insulating housing having a back face provided with means for securing the respective modules to a common supporting member, a front face opposite to the back face and first and second side faces substantially parallel to each other, the first side face of each module cooperating with the second side face of an adjacent module, said front face having first, second and third surface portions, input terminals projecting through the bottoms of outwardly opening sockets arranged on the first surface portion, connecting terminals projecting through the bottoms of outwardly opening sockets arranged on the second surface portion, output terminals projecting through the bottoms of outwardly opening sockets arranged on the third surface portion, said output terminals being connected to the said apparatuses, and said input terminals receiving the said feedback signals, a storage relay unit mechanically coupled in a removable manner to each module, said storage relay unit having a plurality of terminals which are electrically connected in a removable manner to said connecting terminals of the modules, first and second recesses in said first side face and first and second projections on said second side face, each first recess being adapted to receive the first projection of an adjacent module and each second recess being adapted to receive the second projection of an adjacent module; a plurality of transverse conductors within each module, said transverse conductors each having first and second terminals, the said first terminals in each module being adapted for electrical coupling with the second terminals of an adjacent module when said first projections are lodged into said first recesses, to complete the said electrical circuit means, first and second further terminals, the first further terminals in each module being adapted for electrical coupling with the second further terminals of an adjacent module when said second projections are lodged into said second recesses, to complete the said sequence circuit means; and interconnecting means, lodged within the module housing, for connecting the said connecting terminals to the said electrical circuit means, to the said sequence circuit means and to said input and output terminals.

4,228,484

LED FLASHER FOR BATTERY CELL-POWERED LAMP

Malcolm D. Johnstone, Little Sunapee Rd., New London, N.H. 03257

Filed Dec. 4, 1978, Ser. No. 966,354
Int. Cl.³ F21V *33/00*
U.S. Cl. 362—184 **7 Claims**



1. In a lamp powered by self-contained electric cells and having an auxiliary light source to aid in finding the lamp in the dark, the combination in said auxiliary light source comprising:

(a) a flasher circuit contained within said lamp;

(b) means automatically connecting said flasher circuit directly to said self-contained electric cells upon installation of said cells; and

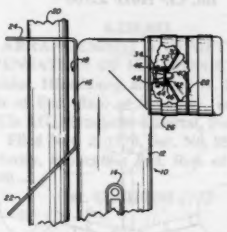
(c) a light-emitting diode mounted in a visible location at the outer body of said lamp and connected directly to said flasher circuit, the flasher circuit being selected with components to provide a flashing rate to said light-emitting diode of at least 1 Hertz with an average current drain from said electric cells of less than 1.0 milliamperes.

4,228,485

BLINKER AIMING POST LIGHT

Carl A. Hubbard, and Colin M. Hudson, both of Hqs. I Corps. (RDK/US) Group, APO, San Francisco, Calif. 96358

Filed Feb. 9, 1979, Ser. No. 10,551
Int. Cl.³ H04M *1/22*
U.S. Cl. 362—191 **5 Claims**



1. A blinker aiming post light comprising:

a stake,

a flashlight having a stake engaging clamp,

said flashlight being attached to said stake,

a DC voltage source,

a flasher integrated circuit including a light emitting diode, and switch means for connecting said circuit to said voltage source,

said DC voltage source comprising flashlight batteries in a flashlight,

said switch means comprises a flashlight switch,

said diode replacing the conventional flashlight bulb,

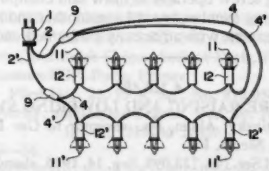
said integrated circuit connecting with the battery contacts in said flashlight.

4,228,486

MINIATURE ELECTRIC LIGHT BULB SETS FOR DECORATIVE ILLUMINATION

Ryosuke Matsuya, Tokyo, Japan, assignor to Towa Dengyo Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,414
Claims priority, application Japan, Mar. 23, 1978, 53/036253[U]
Int. Cl.³ F21V *11/02*
U.S. Cl. 362—237 **1 Claim**



1. A miniature electric light bulb set for decorative illumination which comprises two electric wires leading from an attachment plug, and leads of each electric wire being connected to the leads of two separate electric wires through a branch plate, the entire branch plate being molded with a synthetic resin material to form a sleeve, a first group of miniature electric light bulbs being connected in series to a system of the separate electric wires and a second group of miniature electric bulbs being similarly connected in series to the system of sepa-

rate electric wires, and both groups of the miniature electric light bulbs being formed in a parallel circuit.

4,228,487

COMPOSITE LAMP ASSEMBLY WITH DETACHABLE CLAMPING MEANS

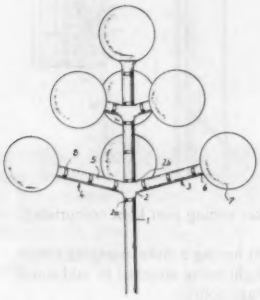
Kurt Hesse, Lemgo, and Hartmut S. Engel, Ludwigsburg, both of Fed. Rep. of Germany, assignors to Staff KG, Lemgo, Fed. Rep. of Germany

Filed Jun. 7, 1978, Ser. No. 913,421

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1977, 7718119[U]

Int. Cl.[2] H01F *23/68*

U.S. Cl. 362—240 **18 Claims**



1. A composite lamp assembly providing artificial illumination, and comprising:

a central mast having at least one composite arm extending from said mast, with said composite arm supporting at least one light fixture attached thereto;

said composite arm comprising a plurality of substantially similarly-shaped connecting sections having end portions adjacently positioned to one another, wherein each end portion is substantially circumferential cross-sectional configuration with inner and outer surfaces facing in opposite radial directions from one another;

detachable clamping means for joining said adjacently positioned end portions to form said composite arm;

wherein said detachable clamping means comprises a substantially ring-shaped clamping unit circumferentially overlapping radially outer surfaces of said adjacently positioned end portions, at least one wedging member engaging radially inner surfaces of said adjacently positioned end portions, and a tensioning screw extending between and threadedly engaging said clamping ring and said wedging member, whereby selective rotation of said tensioning screw operates to draw said clamping unit and said wedging member toward one another and into clamping engagement with adjacently positioned end surfaces.

4,228,488

LUMINAIRE RAISING AND LOWERING SYSTEM

John S. Garchinsky, Aldan, Pa., assignor to Gar Design Research, Inc., Media, Pa.

Continuation of Ser. No. 723,099, Sep. 14, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,726

Int. Cl.[2] F21V *21/14*

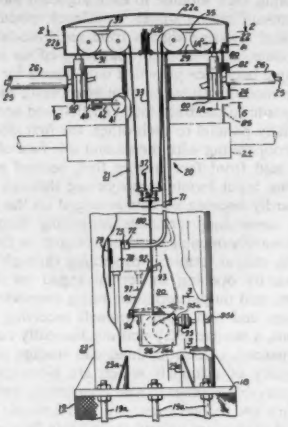
U.S. Cl. 362—250 **9 Claims**

1. A system for raising and lowering luminaires or the like from the tops of poles comprising:

(a) support means toward the top of said poles including a plurality of pulleys,

(b) a carrier normally disposed adjacent said support means, said carrier including a plurality of luminaires or the like and being suspended from said support means by a plurality of high tensile strength elongated means respectively associated with selected ones of said pulleys and having first ends thereof connected to said carrier,

(c) linkage means connected to the respective other ends of said plurality of high tensile strength means, and



(d) a single high tensile strength elongated means connected to said linkage means, the effective points of connection of all of said elongated means being disposed substantially in a common plane, said single high tensile strength elongated means being adapted to be connected to means for raising and lowering said single high tensile strength elongated means.

4,228,489

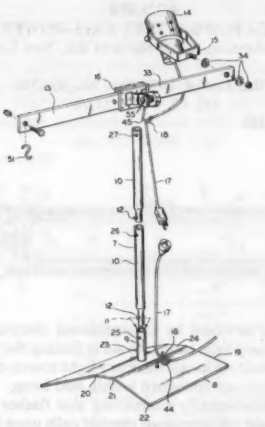
PORTABLE STAND APPARATUS FOR ELECTRIC FLOOD LIGHTS

Edward D. Martin, 3215 S. 84th St., Milwaukee, Wis. 53227

Continuation-in-part of Ser. No. 788,817, Apr. 19, 1977, abandoned. This application Mar. 1, 1979, Ser. No. 16,624

Int. Cl.[3] F21J *21/14*

U.S. Cl. 362—250 **10 Claims**



1.

In a portable stand for the positioning of floodlights having power cords, said stand of the type having an upright and a

horizontal arm supported by said upright, the improvement comprising:

a base to support said upright,

said base being generally rectangular, with four edges,

said base being shaped into a generally V-shaped arched configuration;

said base having two opposed edges which contact the surface upon which said base rests,

said V-shaped configuration angling said two edges of said base onto the area of placement of said base.

4,228,490

DISPLAY DEVICE FOR USE WITH STRONG ILLUMINATION

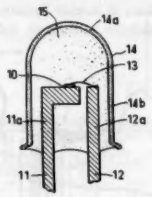
Jacques-Claude Thillays, Herouville-St-Clair, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,100

Claims priority, application France, Aug. 19, 1977, 77 25406

Int. Cl.[2] F21V *3/00*

U.S. Cl. 362—311 **8 Claims**



1. An electroluminescent device comprising at least one emissive diode emitting in the red, a filter element which is substantially transparent in the red and which covers the emissive face of said diode, the light transmission coefficient of said filter element in the blue being significantly higher than the light transmission coefficient of said filter element in the yellow and in the green.

4,228,491

CONTROL METHOD FOR A THREE-PHASE SELF-EXCITED INVERTER

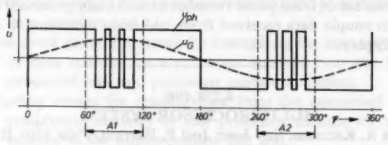
Ludwig Abraham, Mannheim, and Armando Moschetti, Lampertheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Atiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Oct. 26, 1978, Ser. No. 954,833

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747964

Int. Cl.[2] H02M *1/14*

U.S. Cl. 363—41 **2 Claims**



1. In a control method for a three-phase self-excited inverter which is fed from a DC voltage source and in which the fundamental oscillation of the output voltage is adjustable in frequency and amplitude, in particular by the subharmonic method, the improvement comprising:

generating three phased series of triangular waveform signals of the same amplitude and having repetition frequencies bearing predetermined relationships;

generating an input command signal having an amplitude variable between predetermined limits;

level comparing selected of the triangular waveform signals with said input command signal;

generating sequentially non-overlapping respective series of gate pulse signals for initiating switching of an inverter coupled to a respective phase (R, S or T), the gate pulse signals for a respective phase being generated only in two 60° (electrical)-wide operating pulse regions arranged symmetric to the maximum and minimum of the fundamental voltage oscillation of said respective phase (R, S or T) and such that said 60° (electrical)-wide pulse regions overlap the fundamental voltage oscillation of each respective phase.

4,228,492

CIRCUIT ARRANGEMENT AND METHOD FOR THE COMPENSATION OF HARMONIC CURRENTS

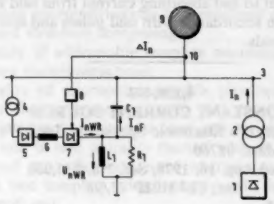
Michael Häusler, Hirschberg, and Karl W. Kanngiesser, Viernheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Nov. 2, 1978, Ser. No. 957,424

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749360

Int. Cl.[2] H02M *1/12*

U.S. Cl. 363—48 **2 Claims**



1. Circuit for coupling a harmonic converter formed of controllable rectifiers to collector bus bars of a three-phase a-c network to compensate harmonic currents in the network, the harmonic converter having an input and an output, including a rectifier and a choke connected to said input, comprising a damped low Q wideband highpass filter covering the entire frequency range of disturbing harmonics, said filter having a choke connected in parallel with a damping resistor, and a capacitor connected in series therewith, said capacitor being connected between the output of the harmonic converter and each collector bus bar of the three-phase a-c network and said parallel connected choke and resistor being connected between the output of the harmonic converter and ground.

4,228,493

POWER CONTROL CIRCUIT AND A SWITCHING MODE POWER SUPPLY EMPLOYING THIS CIRCUIT

Jean de Sartre, and Erich Geiger, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 21, 1978, Ser. No. 972,058

Claims priority, application France, Dec. 29, 1977, 77 39611

Int. Cl.[3] H02M *3/335*

U.S. Cl. 363—56 **9 Claims**

1. A power control circuit for controlling the base current to a switching transistor connected in series with a primary winding of a switching transformer comprising:

first means for detecting the current flow through said transistor and producing a first signal when said current flow exceeds a first predetermined value;

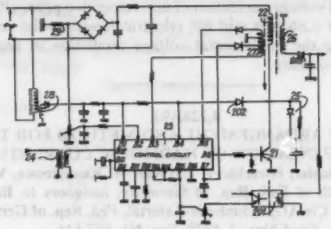
second means for detecting the current flow through a secondary winding of said transformer and producing a second signal when current flow through said second winding exceeds a second predetermined value;

means for generating a sawtooth waveform and comparing

said waveform to a reference voltage to produce a sequence of timing pulses;

first amplifier means for supplying base current to said switching transistor;

second amplifier means for absorbing base current from said switching transistor, said base current being cyclically supplied to and absorbed from said transistor;



logic means connected to said first and second detecting means, said generating and comparing means and said first and second amplifier means for controlling supplying of base current to and absorbing current from said switching transistor in accordance with said pulses and said first and second signals.

4,228,494

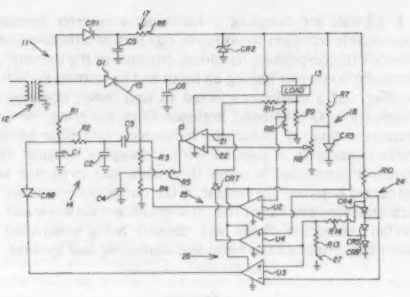
CONSTANT CURRENT SOURCE

Francis J. Stifter, c/o Electronic Specialists, Inc., 171 S. Main St., Natick, Mass. 01760

Filed Aug. 16, 1978, Ser. No. 934,030

Int. Cl.[2] H02P *13/26*

U.S. Cl. 363—85 **9 Claims**



1. A constant current circuit comprising:

ac supply means;

rectifier means connected to transmit current flow from said ac supply means to said load means, said rectifier means comprising a semiconductor switch having a gate electrode for controlling said current flow;

a phase shift network connected to provide a firing signal from said ac supply means to said gate electrode;

sensor means providing a load signal having a sensing level dependent on the level of said current flow;

reference means providing a reference signal having a given level;

comparator means for comparing said sensing and given signal levels and producing an output signal responsive thereto, said comparator means applying said output signal to said phase shift network so as to advance the phase of said firing signal in response to said given level being greater than said sensing level and to retard the phase of said firing signal in response to said sensing level being greater than said given level so as to maintain a constant level of current flow to said load; and

selective shut-off circuit means for shorting the positive half cycles supplied by said ac supply means to said phase shift network so as to disable said semiconductor switch and terminate said current flow.

4,228,495

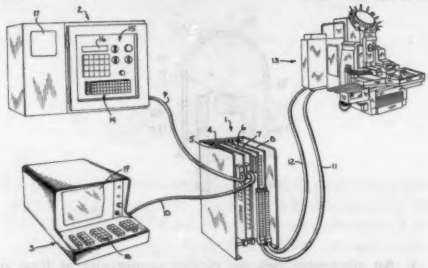
MULTIPROCESSOR NUMERICAL CONTROL SYSTEM

Theodore L. Bernhard, Mentor on the Lake; Ernst Dummermuth, Chesterland; Thomas M. Hoch, Woodmere; Bruce S. Jaffe, Mayfield Heights, and Gregory L. Merrell, Cleveland Heights, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Dec. 19, 1978, Ser. No. 970,959

Int. Cl.[3] G05B *19/18*; G06F *15/16*

U.S. Cl. 364—101 **26 Claims**



9. A numerical control system for operating the servomechanisms and discrete devices on a machine tool which comprises:

a main processor having a main microprocessor which connects to a main memory through a main data bus and a main address bus, said main processor being operable in response to instructions which are stored in its memory and executed by its microprocessor to convert blocks of part program data into motion command signals for the servomechanisms on said machine tool; and

a front panel processor having an FP microprocessor which connects to an FP memory through an FP data bus and an FP address bus and having serial data link means for coupling it to the main processor, means for coupling it to a keyboard, means for coupling it to a display and means for coupling it to a set of front panel switches, said front panel processor being operable in response to instructions which are stored in its memory and executed by its FP microprocessor to couple data from said keyboard and said set of front panel switches to said main processor and to couple data received from said main processor to said display.

4,228,496

MULTIPROCESSOR SYSTEM

James A. Katzman, San Jose; Joel F. Bartlett, Palo Alto; Richard M. Bixler, Sunnyvale; William H. Davidow, Atherton; John A. Despotakis, Pleasanton; Peter J. Graziano; Michael D. Green, both of Los Altos; David A. Greig; Steven J. Hayashi, both of Cupertino; David R. Mackie, Ben Lomond; Dennis L. McEvoy, Scotts Valley; James G. Treybig, and Steven W. Wierenga, both of Sunnyvale, all of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Sep. 7, 1976, Ser. No. 721,043

Int. Cl.[3] G06F *15/16, 15/06*

U.S. Cl. 364—200 **80 Claims**

1. A multiprocessor system of the kind in which separate processor modules operate concurrently and cooperatively for

system control and application processing, said multiprocessor system comprising,

a plurality of separate processor modules,

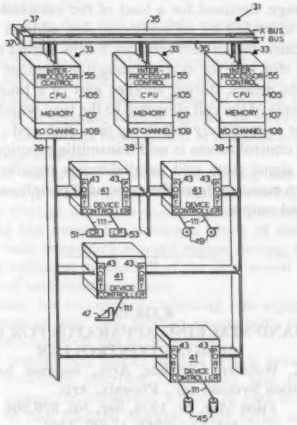
each processor module comprising a central processing unit within the processor module, a separate main read-write word addressable memory within the processor module having sufficient capacity for the storage of system control and application programs and data, and a dedicated memory bus within the processor module connecting the separate main memory in the processor module exclusively to its associated central processing unit in the processor module for access to said programs and data without contention with central processing units in other processor modules,

interprocessor bus means separate and distinct from an input/output system and from a memory bus and interconnecting the processor modules for direct processor module to processor module signaling and data transfer,

said interprocessor bus means including,

a common shared interprocessor bus,

interprocessor control means in each processor module for connection that processor module to the interprocessor bus, and



centralized bus controller means operatively associated with the interprocessor bus and each interprocessor control means for determining the priority of data transfers over the interprocessor bus and for controlling transmissions over the interprocessor bus,

said bus controller means including,

arbitration means for centrally arbitrating the priority of said data transfers and

bus clock generator means for controlling the time sequence of data transfer by a processor module over the interprocessor bus, said processor module including:

reading means for reading data from the associated main read/write memory of that processor module for transmission to the interprocessor bus, and

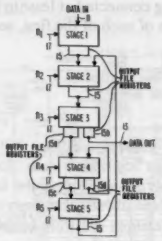
writing means for writing data received from the interprocessor bus into a specied location in the association main read/write memory of that processor module, wherein said reading and writing means are effective to transfer data from the memory of a sender processor module to the memory of a receiver processor module, and wherein each processor module includes a buffer for each other processor module and also includes location pointing means for directing incoming data from an interprocessor bus to a specified location in a related buffer in the memory of a receiver processor module.

4,228,497

TEMPLATE MICROMEMORY STRUCTURE FOR A PIPELINED MICROPROGRAMMABLE DATA PROCESSING SYSTEM

Ram K. Gupta, Downington, and Chandrakant R. Vora, Audubon, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1977, Ser. No. 838,070
Int. Cl.[3] G06F *9/38, 13/00*
U.S. Cl. 364—200 **4 Claims**



1. A template micromemory structure for providing a series of addressed microinstructions to a pipelined data processing system, said structure comprising:

a plurality of addressable template micromemory units for storing microinstructions;

a plurality of microprogrammable pipelined stages, each stage therein associated with and receiving addressed microinstructions from at least one template micromemory unit in said plurality thereof with at least one stage thereof receiving addressed microinstructions from at least two template micromemory units in said plurality thereof; and

template micromemory addressing means connected to said plurality of addressable template micromemory units, said template micromemory addressing means addressing concurrently in each template micromemory units in said plurality thereof a microinstruction stored therein, said addressing means including a first address register serially followed by a plurality of serially connected address registers, said first register initially storing a first instruction address and sequentially incremented through a series of microinstruction addresses in coordination with data flow through said pipelined data processing system, each register in said following plurality thereof temporarily and sequentially storing an address previously stored in its serially preceding register, each register in said following plurality thereof and said first register individually associated with a single unit in said plurality of addressable template micromemory units for addressing a microinstruction stored therein, whereby said plurality of addressable template micromemory units are provided a series of microinstruction addresses and said pipelined data processing system is provided a series of addressed microinstructions.

4,228,498

MULTIBUS PROCESSOR FOR INCREASING EXECUTION SPEED USING A PIPELINE EFFECT

Stephen L. Moshier, Cambridge, Mass., assignor to Dialog Systems, Inc., Belmont, Mass.

Filed Oct. 12, 1977, Ser. No. 841,390
Int. Cl.[2] G06F *15/20, 15/34*
U.S. Cl. 364—200 **16 Claims**

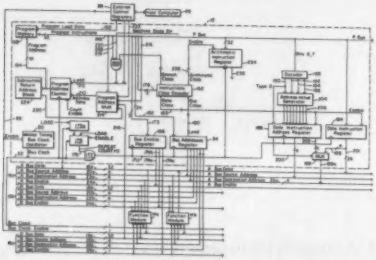
1. A computing apparatus comprising

a plurality of elementary function modules,

at least three buses, each bus comprising a plurality of individual lines, said individual lines being organized at least into

a group of source address lines,
a group of destination address lines, and
a group of data carrying lines,

a first one of said function modules being connected at least to the data and one other group of lines of a first one of said buses, a second one of said modules being connected at least to said data and one other group of lines of a second one of said buses, a third one of said modules being connected at least to the data and one other group of lines of a third one of said buses and a fourth one of said modules being connected at least to the data and one other group of lines of each of the first, second, and third buses,



each other of said plurality of modules being connected at least to said data and one other group of lines of a respective bus whereby each source and destination group of each of said plurality of buses is connected to at least one of said plurality of function modules, and each data group of each of said plurality of buses is connected to at least two of said plurality of function modules, and

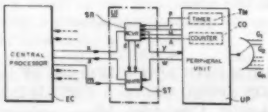
a control means, said control means being connected to all of said buses for directing the operation of said function modules, and said control means placing sequentially changeable source and destination addresses on said bus source address and destination address lines respectively for effectively connecting the function modules in a selected configuration.

4,228,499

INTERFACE UNIT FOR DATA EXCHANGE BETWEEN A CENTRAL PROCESSOR AND A PERIPHERAL UNIT IN TDM TELECOMMUNICATION SYSTEM

Mario Springolo, Milan, and Umberto Lorenzini, Cesano-Boscone, both of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 28, 1977, Ser. No. 846,452
Claims priority, application Italy, Oct. 29, 1976, 28837 A/76
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—200 **10 Claims**



1. In a TDM telecommunication system wherein a central processor dialogues with a plurality of peripheral units each having a multiplicity of loads activable in time slots individually assigned thereto in a recurrent scanning cycle,

the combination therewith of an interface unit interposed between said processor and an associated peripheral unit, said interface unit comprising:

a receiving section with first input means connected to said processor and first output means connected to the associated peripheral unit;

a transmitting section with second input means connected to the associated peripheral unit and second output means connected to said processor;

a series/parallel register in said receiving section having a series input connected to said first input means for the temporary storage of incoming messages from said processor;

a parallel/series register in said transmitting section with parallel inputs connected to said second input means for the temporary storage of return messages from the associated peripheral unit;

memory means in said receiving section having a multiplicity of cells connected to said first output means, said cells being respectively allocated to said loads and identified by address codes corresponding to the time slots assigned thereto;

timer-operated first control means in said receiving section responsive to a signal from said series/parallel register for directing the writing of an operative code of an incoming message, destined for a load of the associated peripheral unit identified by an accompanying address code, in the allocated cell of said memory means during one part of a time slot and for commanding the readout to said first output means, during another part of a time slot, of the contents of the cell allocated to the load which is activable in the immediately following time slot; and

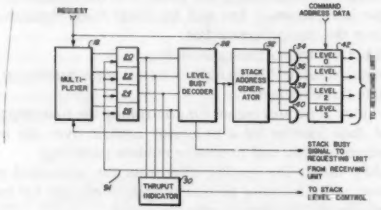
second control means in said transmitting section responsive to a signal from said parallel/series register for routing return messages from the associated peripheral unit to said second output means.

4,228,500

COMMAND STACKING APPARATUS FOR USE IN A MEMORY CONTROLLER

Marvin K. Webster, Glendale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Mar. 27, 1978, Ser. No. 890,006
Int. Cl.[3] G06F *13/00, 3/04*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system of the type wherein a memory controller coordinates the transfer of information between at least one memory device and at least one requesting unit, a stacking apparatus for temporarily storing said information when said at least one memory device is unavailable, comprising:

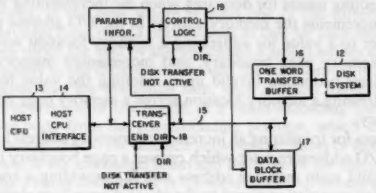
a plurality of distinct storage levels each capable of storing information associated with a different request; and

means for loading said information into the lowest unoccupied level.

4,228,501
DATA TRANSFER TECHNIQUE FOR USE WITH PERIPHERAL STORAGE DEVICES

John M. Frissell, Dracut, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Jun. 21, 1978, Ser. No. 917,631
Int. Cl.[2] G06F *13/04*
U.S. Cl. 364—200 7 Claims



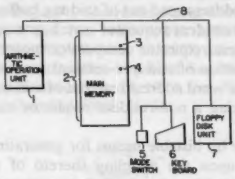
1. A data processing system comprising
a central processor unit;
central processor interface means for transferring data to and from said central processor unit at a first transfer rate;
data storage means including
means for storing data;
means for writing data into said data storing means; and
means for reading data from said data storing means;
said writing and reading of data occurring at a second transfer rate which is higher than said first transfer rate, said data writing means including means for storing blocks of data words in separate storage sectors, successively used blocks of data words being stored in nonadjacent ones of said storage sectors;
data transfer bus means for use in transmitting data between said central processor means and said data storage means;
temporary storage means in bi-directional communication with said bus means for storing a block of data words therein, said temporary storage means having a storage capacity sufficient to store all of the data words stored in any one of said storage sectors;
control means for successively selecting non-adjacent storage sectors of said data storage means with respect to which data transfers are to occur; and
means for transferring blocks of data words between said central processor interface means and said temporary storage means, the transfer of a block of data words with respect to one selected storage sector being completed during the intervening time period between the transfer of a block of data words with respect to said one selected storage sector and the transfer of a block of data words with respect to the next selected storage sector; and
means positioned between said central processor interface means and said bus means and responsive to said control means for preventing the transfer of data between said interface means and said temporary storage means on said bus means when data is being transferred between said data storage means and said temporary storage means and for permitting the transfer of data between said interface means and said temporary storage means on said bus means when data is not being transferred between said data storage means and said temporary storage means.

4,228,502
ELECTRONIC COMPUTER SYSTEM

Yasuhito Wakasugi, Owariasahi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jun. 26, 1978, Ser. No. 919,313
Claims priority, application Japan, Jun. 29, 1977, 52-76527; Jun. 29, 1977, 52-76528
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 2 Claims

1. In an electronic computer system which automatically carries out initial program loading in response to an externally given signal, an improvement comprising means for inhibiting the initial program loading which would otherwise be carried out in response to said externally given signal, and means for designating an alternative operation to be carried out in place of said initial program loading in response to said externally

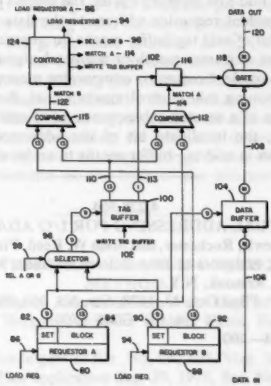


given signal, said initial program loading inhibiting means being constructed such that it permits the initial program loading to be achieved when said alternative operation designating means does not designate the alternative operation in a predetermined time period after the application of said externally given signal.

4,228,503
MULTIPLEXED DIRECTORY FOR DEDICATED CACHE MEMORY SYSTEM

John C. Waite, St. Paul, and David J. Baber, Shoreview, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,791
Int. Cl.[3] G06F *13/00*
U.S. Cl. 364—200 6 Claims



1. In a computer system including a plurality of requestors, each requestor being a resident requestor to its own dedicated cache memory but a non-resident requestor to the dedicated cache memories of the other requestors of the computer system, the cache memories storing copies of data words that are stored in a main memory, the improvement wherein each of said dedicated cache memories comprises:
data buffer means having a plurality of addressable locations therein for storing a plurality of data words thereat and having a first, relatively slow, memory cycle;
tag buffer means having a plurality of addressable locations therein for storing a data word address and an associated invalidate bit at each of said addressable locations and having a second, relatively fast, memory cycle that is of substantially less duration than that of said first memory cycle;
selector means for alternatively coupling to said tag buffer means a first portion of a resident requestor address or a

first portion of a non-resident requestor address for reading out the data word address and associated invalidate bit that are stored in said tag buffer means at the addressed addressable location;

resident requestor comparator means coupled to a second portion of said resident requestor address and to the data word address read out of said tag buffer means for generating a resident requestor match or mismatch signal;

non-resident requestor comparator means coupled to a second portion of said non-resident requestor address and to the data word address read out of said tag buffer means for generating a non-resident requestor match or mismatch signal;

invalidate bit bistable means for generating a data out gate signal upon the coupling thereto of a valid condition invalidate bit and a resident requestor match signal;

data out gating means coupled to said data buffer means and said invalidate bit bistable means for gating out a data word from said data buffer means only if the read out invalidate bit is in a valid condition and said resident requestor comparator means is generating a resident requestor match signal;

control means enabling said resident requestor comparator means to compare, during a first portion of a first one of said first memory cycles, the second portion of said resident requestor address of the data word address read out of said tag buffer means for generating said resident requestor match or mismatch signal, said resident requestor match signal enabling, in turn, said invalidate bit bistable means to gate said data word from said data buffer means through said data out gating means;

said control means enabling said non-resident comparator means to compare, during a second portion of said first one of said first memory cycles, the second portion of said non-resident requestor address to the data word address read out of said tag buffer means for generating said non-resident requestor match or mismatch signal; and,

said non-resident requestor comparator means match signal conditioning said control means to set, during a second portion of a second, subsequent one of said first memory cycles, the invalidate bit of the addressed addressable location in said tag buffer means to an invalid condition.

4,228,504

VIRTUAL ADDRESSING FOR I/O ADAPTERS

David O. Lewis, Rochester, and John W. Reed, Pine Island, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,659

Int. Cl.³ G06F *3/00*

U.S. Cl. 364—200 **7 Claims**

1. In a virtual memory computer system having a central processing unit, main memory and I/O adapters connected to the main memory by a channel, wherein said main memory has a plurality of addressable storage locations and a group of storage locations form a memory page having memory address boundaries, wherein both the CPU and the I/O adapters use virtual addressing and wherein the channel has a priority mechanism for granting use of the channel to the highest priority I/O adapter requesting use of the channel, the improvement comprising:

an I/O address register for storing a memory address for addressing memory;

register means for storing memory addresses, where the register means is accessible by the channel and the CPU;

incrementing means for incrementing the memory address in the I/O address register;

detecting means for detecting when the incrementing means increments the memory address in the I/O address register to a value for addressing a memory location across a memory page boundary, said incremented memory address becoming invalid upon reaching the value for addressing a memory location across a memory page boundary;

means for translating an incremented memory address in said I/O address register which crosses a page boundary into a valid main memory address and for providing a translation completion signal to the channel upon completion of the address translation; and

disconnection means in the channel for disconnecting an I/O adapter from the channel when the I/O adapter requests use of the channel and the I/O address register after the detecting means has detected that a memory address in the I/O address register has crossed a page boundary, said disconnection means holding said I/O adapter disconnected when said I/O adapter requests use of the channel and the I/O address register until the channel receives the translation completion signal indicating completion of address translation, said disconnection means otherwise permitting the I/O adapter to request and use the channel via said register means and provided use of the I/O address register is not requested.

4,228,505

METHOD FOR COMPUTED TOMOGRAPHY

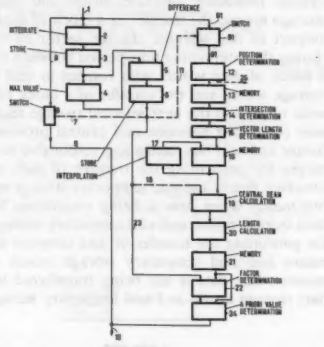
Wolfgang Wagner, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1978, Ser. No. 953,512

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1977, 2753260

Int. Cl.² G01N *23/00*

U.S. Cl. 364—414 **5 Claims**



1. A method for determining the spatial distribution of the absorption of radiation in a slice of a body comprising the steps:

irradiating the body from a plurality of different positions along a plurality of measuring beams which pass through a scanning zone, the slice of the body being completely irradiated by radiation from at least one of the positions and being less than completely irradiated by radiation from at least one other of the positions;

measuring the integral of the absorption of radiation by the

body along each of the measuring beams to produce measuring values, a measuring series comprising the set of all measuring values produced by radiation from a single position;

forming the sum of the measuring values in each of the measuring series;

identifying the maximum of all of said sums;

determining the difference between each of said sums and the maximum sum;

forming, in the case where at least one of the differences deviates from zero, a priori values so that for each measuring series the sum of the associated a priori values corresponds to the difference between the sum formed for that series and the maximum sum, each a priori value being proportional to the length of a beam extending through the body from the corresponding position, which length corresponds to the distance between the points of intersection of the associated beam and the edge of the body, said each being determined as the envelope of all beams which are tangent to the body inside the scanning zone and as an extension of the body which is determined by interpolation; and

reconstructing the absorption distribution inside the scanning zone, by the methods of computed tomography, utilizing both the measuring values and the a priori values.

4,228,506

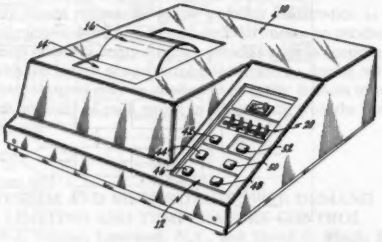
CHARTER WITH AUTOMATIC EDITING

John A. Ripley, Newport Beach; Donald C. Woods, Lompoc, and James Kaine, Santa Ana, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed Nov. 9, 1978, Ser. No. 959,091

Int. Cl.[3] G06F *3/05*

U.S. Cl. 364—415 **9 Claims**



1. A charter for use with a source of time correlated digital systolic and diastolic blood pressure data and heart rate data, for receiving, storing, analyzing, and editing the data, and for producing tables and charts having a particular format for displaying under control of an operator in edited and unedited form both the data as received from the source and the analyzed data, said charter comprising in combination:

first storage means connected to the source of data for storing words of data when they are received from the source of data, and including flag storage locations associated with each of the words of data for storing as required a flag along with each word of data;

automatic editing means connected to said first storage means and operable in response to an edit command to edit by testing stored words of data to determine whether the stored words of data meet certain pre-established qualifications and to write a flag in the flag storage location associated with each of the stored words of data if the stored words of data do not meet the pre-established qualifications, so that edited data words meeting the pre-established qualifications can subsequently be recognized by the absence of a flag in their associated flag storage locations, both the edited and unedited data being retained in said first storage means after editing for selected use including verification and evaluation of the operation of said automatic editing means.

4,228,507

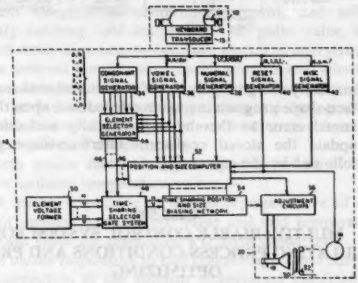
METHODS AND MEANS FOR REPRODUCING NON-ALPHABETIC CHARACTERS

Carl Leban, 608 Saratoga Pl., Lawrence, Kans. 66044

Continuation-in-part of Ser. No. 742,076, Jul. 2, 1968, Pat. No. 3,665,450, and Ser. No. 682,400, Nov. 13, 1967, abandoned, said Ser. No. 742,076, is a continuation-in-part of Ser. No. 682,400, , abandoned. This application May 22, 1972, Ser. No. 255,867

Int. Cl.[2] G06F *15/20*

U.S. Cl. 364—419 **11 Claims**



1. The method of transcribing non-alphabetic characters comprising, entering into a computer one of a given finite plurality of symbols defining one of the elements in the character, successively entering into the computer given finite pluralities of symbols defining other elements in the character, and entering with the given finite plurality of symbols defining other elements in the character predetermined ones of a finite plurality of symbols defining the position of the other elements relative to the element defined by the previous symbol, in the computer decoding the string of symbols to determine a successive element, determining the element, determining the position of the element relative to the previous element, and plotting the elements on the basis of the information in the computer.

4,228,508

AUTOMATIC LONGWALL MINING SYSTEM AND METHOD

Friedrich Benthaus, Esse-Bredeney, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 892,165, Mar. 31, 1978, abandoned. This application Sep. 29, 1978, Ser. No. 947,179

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714506

Int. Cl.[2] G06F *15/20;* E21C *41/00*

U.S. Cl. 364—420 **12 Claims**

1. An improved method of controlling the operation of a longwall excavating machine which during a working trip works the face of a longwall excavation, particularly a power loader mounted for movement along the length of a face conveyor, or the like, the method being of the type wherein a coal-seam interface-shape program is stored in a programmable control arrangement operative for causing the excavating machine to excavate in accordance with the stored program during at least one working trip,

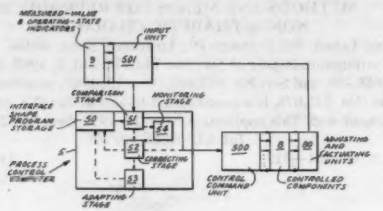
the improvement comprising:

using coal-seam interface sensor means to generate data indicative of true coal-seam interface-shape conditions;

feeding said data into the programmable control arrangement and causing the latter to compare said data against the stored coal-seam interface-shape program and ascer-

tain the error in the stored coal-seam interface-shape program relative to the true coal-seam interface conditions detected by the sensor means;

and causing the programmable control arrangement to automatically and gradually modify the stored coal-seam interface-shape program in ongoing depedence upon the ascertained error to thereby automatically and continually update the stored coal-seam interface-shape program followed by the excavating machine.



4,228,509

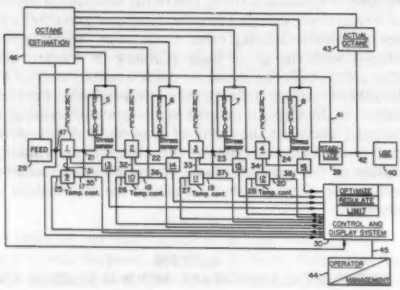
MULTIVARIABLE CONTROL SYSTEM FOR REGULATING PROCESS CONDITIONS AND PROCESS OPTIMIZING

James P. Kennedy, 700 Cary Dr., San Leandro, Calif. 94577

Filed Apr. 7, 1977, Ser. No. 785,617

Int. Cl.[2] G06F *15/46;* **G05B** *13/02;* **C10G** *39/00*

U.S. Cl. 364—501 **12 Claims**



1. In a reforming process having furnace and reactor pairs connected in series, furnace outlet to reactor inlet, for passing feedstock through said reactors for ultimately producing therefrom stabilized product having a desired octane rating O;

said process also having an improved control system comprising temperature regulating means for causing said furnaces to heat said feedstock to predetermined furnace outlet temperatures, each said furnace being individually controllable to establish the corresponding furnace outlet temperature T_i, said temperature regulating means being adjustable to change the value of T_i for any furnace;

and said control system also having furnace stress sensing means for producing stress signals which are measures of stress for each furnace, temperature sensing means for producing outlet temperature signals which are measures of T_i for each furnace, and product evaluating means for producing a product signal which is a measure of O for said product;

said control system comprising computer means responsive to said stress signals, outlet temperature signals and product signals, for computing adjusting signals for adjusting said temperature regulating means such as to change the value of T_i for said furnace outlet temperatures, and said control system having means applying said adjusting signals to said temperature regulating means for making adjustments thereof such as to cause said furnace outlet temperatures to change by amounts ΔT_i, wherein:

$$\Delta Ti = -k_1 \left(\frac{\partial O}{\partial Ti} e_o + \frac{\partial \theta_j}{\partial Ti} e_{\theta j} \right) + k_2 \frac{\partial J}{\partial Ti}$$

ΔT_i=change required in outlet temperature T_i of the i'th furnace,

O=octane number, or equivalent,

o=difference between actual O and desired value therefore,

θ_j=stress in the i'th furnace,

J=an "objective" function of arbitrary form, which defines an optimization criterion,

k_1, k_2=weighting constants, where k_1, is much greater than k_2, and

$e_{\theta j}$=a measure of the relation between actual furnace stress and maximum permissible value thereof.

4,228,510

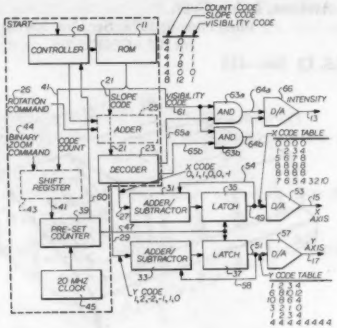
CHARACTER GENERATOR

Walter J. Johnson, Seattle, and James J. Selis, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 1, 1978, Ser. No. 882,393

Int. Cl.[3] G06F *3/153*

U.S. Cl. 364—521 **8 Claims**



1. A character generator for use with an electron beam controlled display in which the movement of the electron beam to generate a visible character is determined by a set of instruction words, wherein each instruction word in the set includes slope, count and visibility information for generating one straight line portion of a character on the display, each straight line portion comprising a plurality of strokes, the length of the strokes varying depending on the slope of the straight line portion but equal within a given straight line portion, wherein the slope information is a single number representative of the particular slope of the straight line portion on the display and the count information is a number representative of the number of strokes in the straight line portion, and thus determines the length of the straight line portion on the display, the display being arranged so that a character is formed by a series of straight line strokes between matrix points which comprise the display, the distance between successive matrix points in the horizontal direction being referred to as a ΔX unit value, and the distance between successive matrix points in the vertical direction being referred to as a ΔY unit value, the ΔX and ΔY unit values being equal to the shortest stroke generated, the generator comprising:

a. memory means for storing a plurality of instruction words;

b. controller means for retrieving each instruction word in

turn in a set of instruction words in order to produce a given character;

c. a counter capable of being preset to a desired value;

d. means setting said counter to the value of the count information in an instruction word;

e. a clock set to run at a frequency which is selected so that the period between successive clock pulses corresponds to the desired time to generate a stroke section of the straight line portion of the given character corresponding to the instruction word;

f. means connecting said clock with said counter such that in operation said clock counts down said counter at the selected frequency, wherein said counter produces a counter pulse in response to each clock pulse;

g. decoder means responsive to said slope information to provide ΔX and ΔY display values which are appropriate multiples of the ΔX and ΔY unit values representative of the orthogonal components of the successive strokes comprising the straight line portion on the display which the slope information represents;

h. means responsive to said decoder means for accumulating, at each counter pulse, the sum of the ΔX and ΔY display values for the successive strokes in successive straight line portions of a character, until the character has been completed, said accumulating means including first and second series connections of an adder/subtractor means, a latch circuit, and means feeding back the output of the latch circuit back to the adder/subtractor means;

i. first and second digital-to-analog converters responsive to the latch circuits for converting the accumulated values of ΔX and ΔY into corresponding analog values which may in turn be applied to deflection circuits in order to move the electron beam on the display sufficiently to produce successive stroke sections of the straight line portion corresponding to the instruction word; and

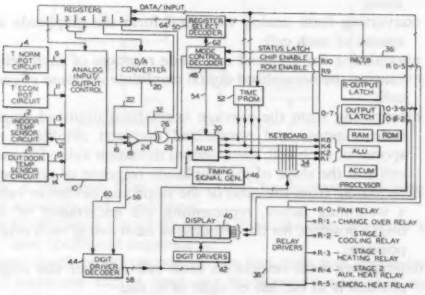
j. gate means responsive to the visibility information in the instruction word and to said decoder means to produce a beam intensity control signal, which varies in accordance with the length of each stroke section to be drawn, which control signal may be applied to intensity circuits to vary the intensity of each stroke in accordance with the length thereof.

4,228,511

SYSTEM AND METHOD OF POWER DEMAND LIMITING AND TEMPERATURE CONTROL

Robert J. Simcoe, Liverpool, N.Y., and David C. Finch, Roanoke, Va., assignors to General Electric Company, New York, N.Y.

Filed Oct. 6, 1978, Ser. No. 949,306
Int. Cl.[2] G05B 11/00; H02J 13/00
U.S. Cl. 364—506 **33 Claims**



3. A room thermostatic control for use in controlling indoor temperature within a structure and for selectively reducing electrical energy consumption of ambient temperature conditioning means during intervals of peak load demand on the electrical system, comprising:

(a) user adjustable reference temperature selection means for selecting a desired reference temperature and first means for deriving therefrom a temperature set point value;

(b) second means for generating a power defer signal responsive to a signal condition, indicative of an imminent electric power peak demand and supplied from a location external of the thermostatic control and the structure being conditioned by ambient temperature conditioning means;

(c) third means responsive to said power defer signal for automatically ramping said temperature set point value in a first boosting direction to increase energization of the ambient temperature conditioning means, and subsequently ramping said temperature set point value in a second defer direction to decrease electrical energization of the ambient temperature conditioning means, whereby indoor ambient temperature is offset in a boost direction from the desired reference temperature and during actual peak load demand is ramped in a defer direction from the desired reference temperature;

(d) fourth means for deriving a signal representative of indoor ambient temperature value;

(e) fifth means responsive to signals representative of said indoor ambient temperature value and said temperature set point value for generating a control signal; and

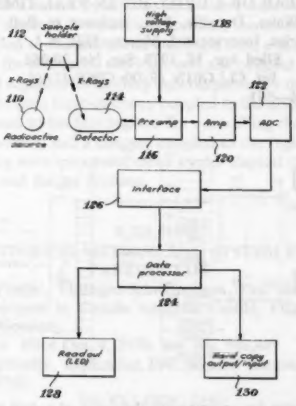
(f) sixth means responsive to said control signal and adapted for connection to the ambient temperature conditioning means to modify operation of the last named means.

4,228,512

NUCLEAR PULSE COUNTING APPARATUS AND TECHNIQUE

John W. Thompson, Arthur J. Kamp, both of Midland, and Edward R. Sederlund, Saginaw, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 3, 1978, Ser. No. 902,312
Int. Cl.[2] G06F 15/46
U.S. Cl. 364—527 **5 Claims**



1. In a nuclear pulse counting experiment wherein pulse charges are developed pursuant to a detection step, and converted to amplified voltage pulses proportional to the magnitude of the pulse charges, the method of tabulating such voltage pulses, occurring in a specified energy range, and defining the energy peak center, comprising the steps of: sorting the voltage pulses into at least 128 characterizations according to magnitude, said sorting function being performed essentially without compensation for meandering amplification gain shifts, discontinuing the experiment based on a statistically

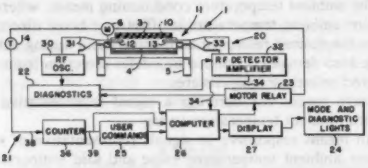
reliable counting of a numerically sufficient sample of pulse charges, determining that characterization containing the maximum count, ±1 characterization, and defining that characterization as the energy peak center, interpolating to refine the energy peak center to an accuracy of at least 1/10 of a characterization, and tabulating the numerical count of the pulse charges based on the refined energy peak center.

4,228,513

MONITOR SYSTEM AND METHOD FOR DETECTING SEQUENTIAL EVENTS IN A CYCLICAL PROCESS

Frank A. Doljack, Chagrin Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 13, 1978, Ser. No. 960,424
Int. Cl.[2] G08B *21/00*; G06F *15/46*
U.S. Cl. 364—550 **118 Claims**



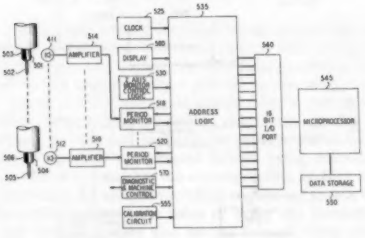
54. A monitoring system for monitoring the occurrence of a plurality of events in a cyclical process, comprising: event transducer means for detecting the occurrence of such events in such process, progress transducer means for detecting the progress of such process, control means for starting and stopping such process, and computer means for sensing whether respective events occur at expected positions in the progress of such process, said computer means being coupled to said control means to operate the same to stop such process when a prescribed number of events has been missed.

4,228,514

METHOD AND SYSTEM FOR DETERMINING THE WEAR OF A DRILL BIT IN REAL TIME

Roger E. Weiss, Denville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 16, 1979, Ser. No. 30,061
Int. Cl.[3] G01N *19/00*; G06F *15/46*
U.S. Cl. 364—551 **21 Claims**



4. Apparatus for ascertaining the wear of a drill bit during the performance of a drilling operation on a workpiece, the apparatus including:

means for monitoring positions of said drill bit prior to engagement with said workpiece and after emergence from said workpiece;

means, responsive to said position monitoring means, for determining a first rotational speed of said drill bit at the indicated position prior to engagement with said workpiece and a second rotational speed of said drill bit at the indicated position after emergence from said workpiece;

means for storing temporarily said first rotational speed of said drill bit;

means for measuring an elapsed time between said first and second rotational speeds;

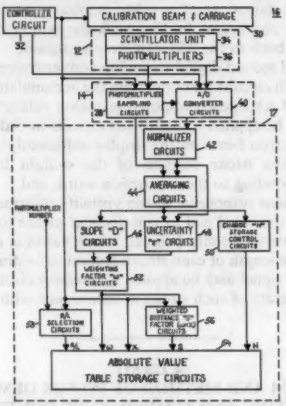
means, responsive to said speed determining means, said rotational speed storing means and said time measuring means, for determining the amount of energy expended during said drilling operation based on said first and second rotational speeds and said elapsed time, said means further generating a measure of the wear of said drill bit based on said energy determination.

4,228,515

METHOD AND APPARATUS OF DIGITAL CALIBRATION AND POSITION ANALYSIS OF A RADIANT EMISSION

Sebastian Genna, 618 Belmont St., Watertown, Mass. 02172, and Sing C. Pang, 2 Soldier's Field Pk., Apt. #601, Boston, Mass. 02160

Continuation-in-part of Ser. No. 677,205, Apr. 15, 1976, Pat. No. 4,095,107. This application Jun. 13, 1978, Ser. No. 915,286
Int. Cl.[3] G01T *1/20*
U.S. Cl. 364—571 **11 Claims**



1. A method of digital calibration and position analysis of impingement of a radiant emission on a multicell detector comprising:

directing radiant emissions to a number of known origin positions at said multicell detector; and for each origin position;

sampling the amplitude response of each cell a number of times;

converting form analog to digital form the amplitude response of each cell;

normalizing the digitized amplitude response of each cell;

averaging the normalized digital amplitude response of each cell;

determining from the average normalized digitized amplitude response and normalized digitized amplitude response of each cell, the standard deviation value for each cell and the slope of the amplitude response of each cell;

determining from the ratio of the slope and deviation value a weighting factor, representing the uncertainty of the origin position, for the response of each cell at each origin position;

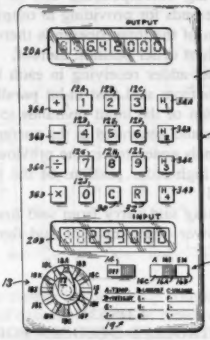
determining with respect to each cell whether the origin position is to the left or right of it; and

storing in one of a right and a left table for each cell a representation of the location of each origin position of emission, the weighting factor, and normalized amplitude response for each cell for each origin position.

4,228,516
COMPUTER FOR METRIC CONVERSION

Harry L. Johnston, Sr., 4210 Belmar, Toledo, Ohio 43612

Filed Dec. 26, 1978, Ser. No. 972,883
Int. Cl.[3] G06J 1/00; G06F 5/00
U.S. Cl. 364—602 1 Claim

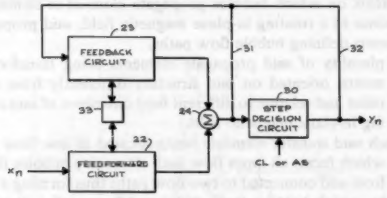


1. A metric conversion computational system comprising:
(a) a control unit with a face
(b) a plurality of control switches to impress input data into the computer; said control switches being located in the face of the control unit;
(c) switch means to switch electrical circuitry from arithmetic to metric conversion system; said switch means being located on the face of the control unit;
(d) a control switch on said control unit for changing the metric conversion computational system from one type of conversion media to another;
(e) analog electrical means connected to said control switch, said analog electrical means comprising a rotatable member having discrete resistance values for each conversion area.

4,228,517
RECURSIVE FILTER

James N. Constant, 1603 Danbury Dr., Claremont, Calif. 91711, assignor to James N. Constant, Claremont, Calif.

Continuation-in-part of Ser. No. 698,101, Jun. 21, 1976, abandoned. This application Dec. 18, 1978, Ser. No. 970,648
Int. Cl.[3] G06F 15/31
U.S. Cl. 364—724 25 Claims

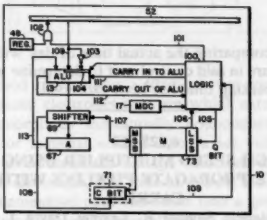


1. A recursive filter characterized by increased efficiency and accuracy and comprising:
a feedforward circuit having as input the data sequence x_n and coefficient sequence α,
said feedforward circuit having first data and coefficient memories and at least one feedforward multiplier and integrator;
a feedback circuit having as input the data sequence y_n and coefficient sequence β,
said feedback circuit having second data and coefficient memories and at least one feedback multiplier and integrator;
a step decision circuit connected in at least one of said feedforward and feedback circuits; and
means connecting said feedforward and feedback circuits for forming said recursive filter, with said step decision circuit including means for establishing a threshold for each value of n, said filter having as input the data sequence x_n and providing as output the data sequence y_n where n=1, 2, . . . , N.

4,228,518
MICROPROCESSOR HAVING MULTIPLY/DIVIDE CIRCUITRY

George P. Chamberlin, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1978, Ser. No. 945,736
Int. Cl.[2] G06F 7/54
U.S. Cl. 364—759 8 Claims



1. A microprocessor having circuitry for multiplying or dividing, comprising: an arithmetic and logic unit; a first register for holding a multiplier and for holding a least significant portion of a binary number to be divided and for containing a quotient upon completion of a division; a second register for holding a most significant portion of a product obtained from a multiplication routine and for holding the most significant portion of the binary number to be divided and for storing a remainder obtained from a divide routine, the second register being coupled to the arithmetic and logic unit; a shift network coupled to the arithmetic and logic unit and coupled to the first and second registers for shifting data outputted by the arithmetic and logic unit; logic circuitry coupled to the arithmetic and logic unit and to the first register for controlling the multiplying and dividing; and a counter coupled to the logic circuitry for counting microprocessor clock cycles elapsed during multiplication and during division.

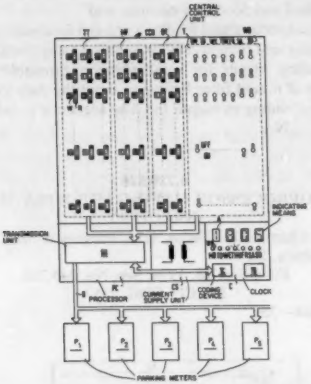
4,228,519
MONITORING METHOD AND SYSTEM FOR A PARKING LOT

Heinrich Pfeifer, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,407
Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744768
Int. Cl.[3] G07C 1/30
U.S. Cl. 364—900 15 Claims

1. A method for electronically monitoring a parking lot using a central control unit and a plurality of individual parking meters connected to the central control unit comprising the steps of:
supplying each individual parking meter with the actual time of day from the central control unit;
determining, for the number and/or value of valid tariff coins inserted in a parking meter, an amount of time corresponding to said valid tariff coins, said determined time

being added to said actual time of day to arrive at a time of departure until which the tariff has been paid; and



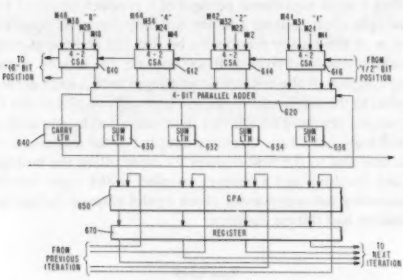
repeatedly comparing the actual time of day with said time of departure in said control unit to determine whether the paid-for parking time has been exceeded.

4,228,520

HIGH SPEED MULTIPLIER USING CARRY-SAVE/PROPAGATE PIPELINE WITH SPARSE CARRIES

Robert C. Letteney; Samuel R. Levine; David T. Shen, and Arnold Weinberger, all of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1979, Ser. No. 36,198
Int. Cl.[3] G06F *7/52, 7/50*
U.S. Cl. 364—760 **7 Claims**



1. In a multiplier apparatus wherein p bits of a q-bit ($p<q$) multiplier word are examined in one iteration to produce r multiples of a multiplicand word, said multiples being added together to produce a partial product for the selected p-bit multiplier portion, said partial product, after having been properly shifted, being added to a partial product to be generated in the next iteration for the next higher-order p-bit multiplier portion to be selected in said next iteration to produce a sum of the newly generated partial product and the previously generated and properly shifted partial products such that after the final iteration of the multiplication a final product of the multiplicand word and the multiplier word is produced;

a carry-save/propagate adder apparatus for performing iterative addition of the partial products comprising;

an n-to-2 ($n \geq 3$) carry-save adder stage having a plurality of n-to-2 carry-save adders, one for each bit position of input operands, and receiving n plural-bit operands including the multiples of said multiplicand word generated in each iteration for reducing said n plural-bit operands to two other plural-bit operands representing a sum and a carry of said n plural-operands,

at least one first m-bit parallel adder, m being no larger than the number of said n-to-2 carry save adders, one for each m bit positions of said operands, said first m-bit parallel adder receiving corresponding bits of said two other plural-bit operands for providing m output signals representing a sum of the input operands thereto, and a carry from the highest order position thereof,

a second parallel adder receiving in each iteration said m output signals from said first m-bit parallel adder representing the sum of the input operands to said first m-bit parallel adder and generated in the current iteration, and m output signals generated in the previous iterations and representing high-order portions of the previous partial products; and

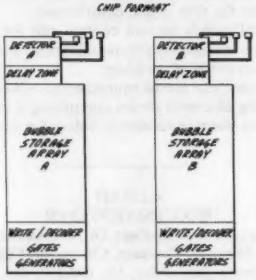
means transmitting said carry from said first m-bit parallel adder to a lower order input of said first m-bit parallel adder.

4,228,521

PHASE CONTROLLED DECODER FOR BUBBLE MEMORIES

Sidney J. Schwartz, Vista, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1979, Ser. No. 18,513
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—4 **10 Claims**



1. A phase controlled decoder on a magnetic bubble domain propagation structure which includes means capable of supporting magnetic domains thereon and which has propagate elements on which bubbles propagate element-to-element in response to a rotating in-plane magnetic field, said propagate elements defining bubble flow paths,

a plurality of said propagate elements being transfer elements, oriented on said structure differently from each other and relative to different field directions of said rotating in-plane magnetic field,

each said transfer elements being located in one flow path which forms an input flow path to receive bubbles therefrom and connected to two flow paths thus forming a gate by which bubbles from said input flow path will be directed to one of the two flow paths forming output flow paths from said gate,

at least one of said output flow paths from one gate being connected to the input flow path of a gate located subsequent to the flow of bubbles through said one gate, and

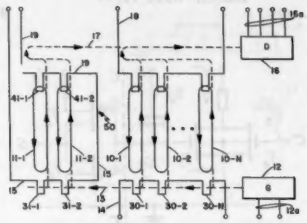
a single electrical conductor means coupled to a plurality of said transfer elements to activate said gate to direct said bubble onto one of said output flow paths in response to the application of a current pulse on said electrical conductor means.

4,228,522

BUBBLE MEMORY WITH REDUNDANT ON CHIP ERROR MAP STORAGE LOOPS

Peter K. George, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 15, 1979, Ser. No. 3,651
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—15 10 Claims



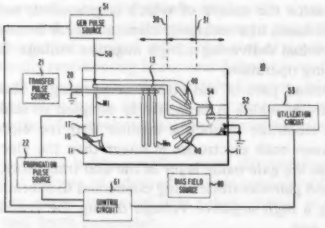
1. A magnetic bubble memory chip comprised of;
one plurality of data loops, some of which may be defective, for storing magnetic bubbles representative of data bits;
a pair of error map loops, one of which may be defective, for selectively storing an error map containing magnetic bubbles that are respectively spaced apart by N_1 magnetic field rotations where N_1 is any integer greater than or equal to two;
a bubble generator for generating bubbles for said data loops and said error map loops in response to control signals applied thereto;
a serial-parallel bubble propagation path having a serial input for receiving bubbles from said generator and having parallel outputs respectively connected to each of said data loops and error map loops;
the serial portion of said serial-parallel path including respective transfer-in gates for said error map loops, a single transfer-in control line for said gates, and N_2 magnetic bubble propagation elements lying between said gates where N_2 is any positive integer not equal to KN_1-1 and where K=1, 2, . . .

4,228,523

CONDUCTOR ACCESS BUBBLE MEMORY ARRANGEMENT

Andrew H. Bobeck, Chatham, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1979, Ser. No. 18,454
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—19 10 Claims



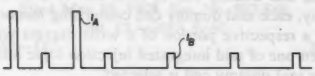
1. A magnetic bubble memory comprising a host layer (11) of a material in which magnetic bubbles can be moved, and means (16,17,M_1 . . . M_N,13,22) for moving magnetic bubbles in the layer, the means comprising at least one continuous layer (16) of electrically-conducting material for providing a current path for pulses (see FIG. 3) impressed therein and means (M_1 . . . M_N and 13) for defining a periodic pattern of magnetic field gradients in response to the pulses, the memory being characterized in that the overall width of the current path is sufficiently different in at least first and second areas (to the left of line 30 and to the right of line 31 in FIG. 1) to provide substantially different current densities in response to each of the current pulses.

4,228,524

MULTILEVEL SEQUENCE OF ERASE PULSES FOR AMORPHOUS MEMORY DEVICES

Ronald G. Neale, Beeches, England, and Grady M. Wood, Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 24, 1979, Ser. No. 5,944
Int. Cl.[2] G11C *7/00*
U.S. Cl. 365—163 21 Claims



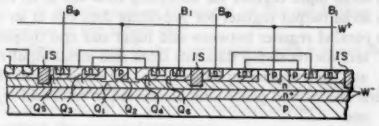
1. A method of resetting a filament-type memory device including spaced electrodes between which extend a body of generally amorphous substantially nonconductive memory semiconductor material which, when a set voltage pulse in excess of a given threshold voltage value and duration is applied to said electrodes, has formed therein a crystalline low resistance filamentous path resettable into a generally amorphous condition by application of one or more voltage pulses producing reset current pulses through said filamentous path to change the phase of the crystalline filament and are of a duration which is so short that upon termination of each reset current pulse the filamentous path will be quickly quenched to leave at least portions of the filamentous path in a substantially amorphous condition, said method comprising: applying to said electrodes a sequence of reset voltage pulses which produce a sequence of reset current pulses, a first plurality of reset voltage pulses in said sequence having a maximum amplitude below said give threshold voltage value to produce reset current pulses of a first constant amplitude, and a second plurality of reset voltage pulses in said sequence having a maximum amplitude above said given threshold voltage value to produce reset current pulses of a second constant amplitude less than said first consent amplitude.

4,228,525

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Kuniyasu Kawarada, Musashino; Masao Suzuki, Kodaira; Chikai Ono, Kawasaki, and Kazuhiro Toyoda, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Fujitsu Limited, Kanagawa, both of, Japan

Filed May 11, 1979, Ser. No. 38,016
Claims priority, application Japan, May 11, 1978, 53-56007; Mar. 2, 1979, 54-24983
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—174 19 Claims



1. A semiconductor integrated circuit device having an

array of integrated injection logic memory cells, each said cell comprising first and second transistors of first conduction type with emitters connected in common to form an injector of said cell, third and fourth transistors of a second conduction type opposite said first type having their collectors respectively connected to the collectors of said first and second transistors, said third transistor having its base is connected to said collector of said fourth transistor and said fourth transistor having its base connected to said collector of said third transistor, and said first and second transistors having their bases connected in common with the emitters of said third and fourth transistors; said device comprising

a first word line connecting said injectors of said cell,

a second word line comprising a bulk portion of said semiconductor of said device selectively connected to said commonly connected bases of said first and second transistors and said emitters of said third and fourth transistors, and

at least one dummy cell at each end of each said of said array, each said dummy cell comprising means for shunting a respective portion of a write current which flows when one of said integrated injection logic memory cells near said dummy cell is selected.

4,228,526

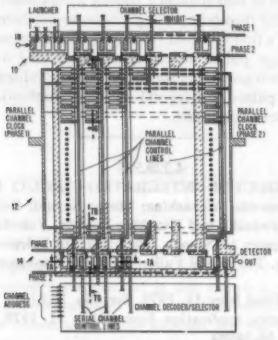
LINE-ADDRESSABLE SERIAL-PARALLEL-SERIAL ARRAY

Hua-Tung Lee, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,634

Int. Cl.[2] G11C *9/00, 8/00, 11/34*

U.S. Cl. 365—183 **9 Claims**



1. A line addressable serial parallel serial storage array comprising:

a serial input register for accepting data bits at an input;

a serial output register for providing data bits at an output;

a parallel register between said input and said output registers for receiving data bits from said serial input register and for transferring data bits to said serial output register;

first and second phase lines connected to each said registers; and

control lines connected to each said registers, each one of said control lines being adapted to selectively inhibit the propagation of data bits in said registers.

4,228,527

ELECTRICALLY REPROGRAMMABLE NON VOLATILE MEMORY

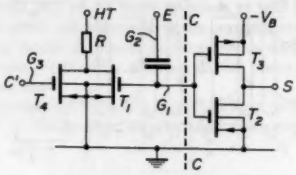
Bernard Gerber, Neuchatel, and Fritz Leuenberger, Hinterkappelen, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

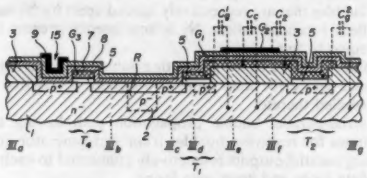
Filed Feb. 22, 1979, Ser. No. 14,251

Claims priority, application Switzerland, Feb. 22, 1978, 1889/78

Int. Cl.[3] G11C *11/40*

U.S. Cl. 365—185 **9 Claims**





1. An electrically reprogrammable non-volatile memory device comprising an integrated circuit including complementary MOS transistors provided with a polycrystalline silicon floating gate electrode, in a common n^--type substrate which forms the grounded electrode, wherein said circuit is composed of three parts:

the first part being utilized to perform writing of information and addressing;

the second part being utilized to perform erasure; and the third part being utilized to perform read-out of the information;

said floating gate electode forming a common electrode to said three parts of the device; said first part comprising a p-channel writing transistor, having its drain, which provides a p^+-n junction for injection of electrons, connected, on the hand, to the drain of a p-channel control transistor the source of which is grounded, and, on the other hand, to a resistance element which is connected to a terminal delivering a high negative voltage during the writing operation;

said second part of the circuit comprising a second gate electrode which is capacitively coupled to said floating gate electrode in such a manner that the electric field between both electrodes is lower than the electric field across the gate oxide layer of the said transistors, and said second gate electrode being connected to a terminal delivering a high negative voltage during the erasure operation; and

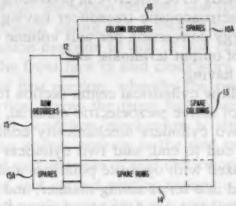
said third part of the circuit consisting of a p-channel read-out transistor, the source of which is grounded, its gate forming a portion of the floating gate electrode and its drain being connected to a read-out terminal and to a terminal of a loading element having its other terminal connected to a negative supply voltage.

4,228,528

MEMORY WITH REDUNDANT ROWS AND COLUMNS

Ronald P. Cenker, Coplay, and Frank J. Procyk, Center Valley, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 9, 1979, Ser. No. 10,739
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—200 6 Claims



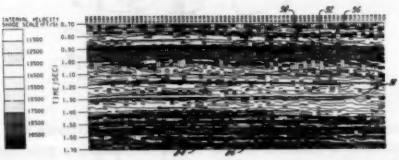
1. A semiconductor memory (10) comprising a semiconductor chip in which memory cells are arranged in vertical and horizontal lines each with its own decoder and in which some of the lines form the standard memory array (12) and some of the lines (13, 14) are initially spares to be substituted for lines which include defective cells characterized in that each of the decoders (20) associated with the standard lines includes means (21) for disconnecting the associated line from the standard memory array and in which each of the decoders (30) associated with the spare lines includes means (41) for providing any such decoder with the address of a decoder associated with a disconnected line, thereby effectively substituting its associated line in the standard array.

4,228,529

METHOD FOR DISPLAYING SEISMIC DATA

I-Chi Hsu, and Anne L. Simpson, both of Houston, Tex., assignors to Western Geophysical Co. of America, Houston, Tex.

Filed Feb. 28, 1979, Ser. No. 16,234
Int. Cl.[3] G01V *1/34*
U.S. Cl. 367—70 9 Claims



1. On a two dimensional seismic display of a cross section of subsurface earth layers, said display having a generally vertical Y axis divided into desired unit parameters of depth and an X axis generally representing horizontal distance over the surface of the earth along which are marked the locations of a plurality of data sampling points spaced apart at desired distance intervals, a method for resolving lineated data comprising the steps of:

(a) beneath each data sampling point, determining along the Y axis a graph of a desired intrinsic property of said earth layers whose numerical data values change as a function of said depth parameter;

(b) scanning the graphs along the Y axis of first and second adjacent data sampling points to define contour crossing points at desired unit intervals of said graphed numerical data values and determining the algebraic sign of the slope of said graph at each said contour crossing point;

(c) connecting, by marked contour segments between said adjacent data sampling points, contour crossing points that match as to numerical data value and algebraic sign;

(d) terminating contour segments, from one said data sampling point, at a point between said two adjacent data sampling points, when no matching contour crossing is found on the other said sampling point;

(e) forming a plurality of trapezoids between said adjacent sampling points, the top and bottom boundary of each said trapezoid being defined by neighboring contour segments, the lateral boundaries being defined by the respective Y axes; and

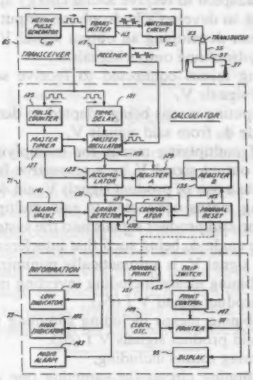
(f) applying a shading pattern, having a desired characteristic, within one such trapezoid and applying shading patterns having other desired characteristics to other such trapezoids.

4,228,530

MUD LEVEL MONITOR

Taylor G. Bergey, 4306 Tonawanda, Houston, Tex. 77035

Filed May 19, 1978, Ser. No. 907,548
Int. Cl.[2] G01S *9/68*
U.S. Cl. 367—112 22 Claims



1. In well drilling according to the rotary method in which liquid base drilling fluid is pumped down the bore of the well being drilled, through the drill bit and back up the well bore to a return line extending laterally from the well bore and thence to a reservoir from which it is again pumped, the method of monitoring the level of drilling fluid in the return line comprising the steps of:

providing an open window in the top of the return line,

positioning the windowed portion of the line above the level of the fluid in the path of drilling fluid from said portion to the reservoir,

mounting an electro-sonic transducer above the window,

beaming ultra sound from the transducer to the air-drilling fluid interface in the fluid return line,

measuring the transit time of the beam from the window to the interface and back to the window to give information as to the level of the interface in the line,

generating timing signals during such transit and counting down an accumulator with said signals during such transit to give information as to height of the air-drilling fluid interface in the return line,

comparing the count in the accumulator with a preset datum count, and

giving an alarm when the accumulator count departs from the datum count by a predetermined amount,

recording the accumulator count,

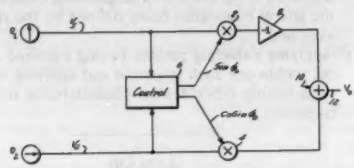
turning off the alarm, and

resetting the datum count equal to said accumulator count.

4,228,531
AUTOMATIC UNDERWATER NULL STEERING

Bruce P. Bogert, Morristown, and Peter Hirsch, Parsippany, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 17, 1970, Ser. No. 57,841
Int. Cl.³ H04B *1/06*
U.S. Cl. 367—135 **3 Claims**



1. In an underwater sound transmission system, the improvement comprising:

a pair of dipole hydrophones, said hydrophones being positioned so that their sensitivity patterns are orthogonal with respect to each other, each of said hydrophones being adapted to receive sound energy approaching at an angle ϕ to develop a hydrophone output signal V,

said system developing an output signal V_o in response to said hydrophone output signals V,

computing means connected to receive said hydrophone output signals V,

said computing means being adapted to derive functions of an angle ϕ_o from said signals V,

a pair of multiplying means for multiplying each hydrophone output signal V by a respective function of ϕ_o to generate a pair of product signals $V_1 \sin \phi_o$ and $V_2 \cos \phi_o$,

combining means connected to said multiplying means to combine said product signals into the system output signal V_o, the angle ϕ_o being such that interference noise in said output signal V_o is automatically minimized,

said combining means including inverting means for inverting a product signal V f (ϕ_o),

said combining means including summing means for summing said product signals V f (ϕ_o),

said summing means including,

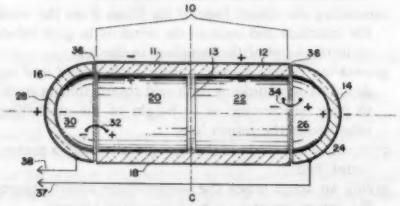
a first summing circuit for summing one of said product signals $V_2 \cos \phi_o$ and an inverted product signal $-V_1 \sin \phi_o$ to derive a first system output signal V_{01}, and

a second summing circuit for summing two of said product signals $V_2 \cos \phi_o$ and $V_1 \sin \phi_2$ to produce a second system output signal V_{02}.

4,228,532
PIEZOELECTRIC TRANSDUCER

Claude C. Sims, 1308 Heron Dr., Orlando, Fla. 32803

Filed Jan. 29, 1979, Ser. No. 7,435
Int. Cl.³ H04R *17/00*
U.S. Cl. 367—159 **14 Claims**



1. An electroacoustic transducer having high acoustic-to-electric energy conversion per unit volume comprising:

a pair of output terminals; and

a body having a cylindrical central section and hemispherical end sections, said central section is formed from a first type of active pieozoelectric material and said end sections are formed from a second type of active piezoelectric material and electrically interconnected with respect to said output terminals wherein the polarizations of said central section and said end sections are arranged to convert acoustic pressure on the entire external surface area of said body to be effective in producing electrical energy.

11. An electroacoustic transducer having high acoustic-to-electric energy conversion per unit volume comprising:

1. a pair of output terminals; and

2. a body having

(a) a hollow cylindrical center section formed from a first type of active piezoelectric material, such section having two cylinders mechanically connected concentrically end to end, said two cylinders circumferentially polarized with opposite polarities and electrically connected in a series-aiding manner; and

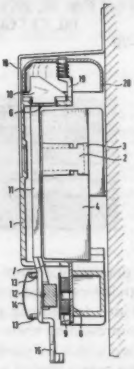
(b) hemispherical end sections formed from a second type of active piezoelectric material, said two end sections radially polarized with oppostie polarities and electrically connected with said central section in a series-aiding manner;

wherein said pair of output terminals is connected to said body so that the entire external surface area of said body is effective in producing electrical energy.

4,228,533
AUTONOMOUS PENDULUM MECHANISM FOR CLOCKWORKS

Roland Siefert, Bad Durrheim, Fed. Rep. of Germany, assignor to Kienzle Uhrenfabriken GmbH, Schwenningen, Fed. Rep. of Germany

Filed Mar. 23, 1979, Ser. No. 23,365
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 7809694[U]
Int. Cl.³ G04B *15/00, 17/02, 37/00*
U.S. Cl. 368—134 **12 Claims**



1. For use with a clockwork of the type comprising a clockwork casing the front face of which has spindles thereon for the clock hands, a pendulum mechanism adapted to be attached as a completely assembled unit to said clockwork casing and operative independently of said clockwork, said pendulum mechanism comprising a generally vertical supporting plate adapted to be attached to said clockwork casing in overlying spaced relation to the front face of said casing, said supporting plate having a pivot bearing thereon which is located vertically above said spindles when said pendulum mechanism is attached to said clockwork casing, a pendulum arm having

an upper end mounted for pivotal motion in said bearing, said arm depending vertically downward from said pivot bearing across the rear side of said supporting plate for swinging motion across the front face of said clockwork casing in the space between said supporting plate and the front face of said casing, said arm in the direction of its extension being of generally V-shape and comprising a first portion which extends across the front face of said clockwork casing downwardly from said pivot bearing at an angle to the line between said pivot bearing and said spindles into the region between said spindles and one side of the clockwork casing and a second portion which is angled in a direction opposite to that of said first portion and extends across the front face of said clockwork casing downwardly from said first portion, whereby the swinging motion of said first portion across the front face of said clockwork casing when said pendulum mechanism is attached to said clockwork casing occurs entirely in the said region between said spindles and said one side of said clockwork casing while the lower end of said second portion swings across the front face of said clockwork casing between points which are substantially equidistant from the opposite sides of said clockwork casing in the region below said spindles, and an electrical drive mechanism in said pendulum mechanism adjacent the lower end of said second portion for effecting swinging motion of said pendulum arm, said drive mechanism comprising a permanent magnet carried by one of said supporting plate and said second portion, and an electrically energizable coil carried by the other of said supporting plate and second portion.

4,228,534

ELECTRONIC WATCH CONTROL DEVICE FOR MANUAL ACTUATION

Jean Fellrath, Neuchâtel, and Jean-Felix Perotto, Hauterive, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchâtel, Switzerland

Filed Nov. 2, 1977, Ser. No. 847,813

Claims priority, application Switzerland, Nov. 4, 1976, 13899/76

Int. Cl.[3] **G04B** *19/00;* **G04C** *17/00;* **H01H** *35/00, 47/00*

U.S. Cl. 368—224 **5 Claims**

1. An electronic watch control device for manual actuation comprising a capacitive sensor which includes a conductive layer applied on at least a part of the inner surface of the watch-glass and the capacitance of which with respect to ground as represented by the watch-case varies when the user puts a finger on the watch-glass, the said sensor being part of a capacitive voltage divider, the control device further comprising means for applying to the said capacitive voltage divider an a.c. voltage of a substantially higher frequency than the mains frequency, synchroneous detection means for detecting the high-frequency voltage across the said capacitive sensor,

wherein the synchroneous detection means include a switching device connected to the terminals of the capacitive sensor and controlled by the said high frequency so as to alternately shot-circuit the sensor and apply the voltage appearing at the terminals of the sensor to a low-pass filter, and comparison means for comparing the value of the said high frequency voltage to a reference voltage, said comparison means being adapted for producing a control signal depending on whether or not the sensor is actuated by placing a finger-tip on the watch-glass.

4,228,535

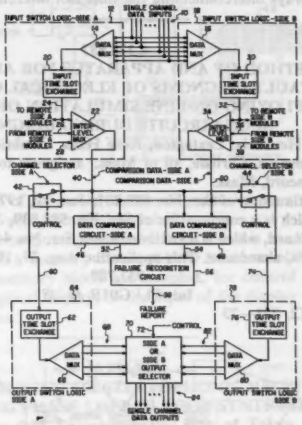
DUAL TDM SWITCHING APPARATUS

Harold W. Workman, and David C. Nicholas, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1979, Ser. No. 15,028

Int. Cl.[3] **H04Q** *11/04;* **H04J** *3/14*

U.S. Cl. 370—16 **15 Claims**



5. The method of increasing overall switching system signal throughput reliability comprising, the steps of:

dividing the system into a plurality of levels;

providing primary and backup switches at each level;

separately interconnecting the primary and backup switches with interlevel data communication buses; and

routing signals from levels having inoperative primary switches through the backup switches and backup interlevel buses to be output by primary switches on those levels whose primary and backup switches are both operative.

4,228,536

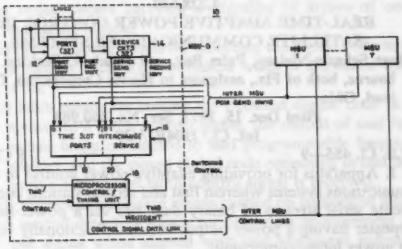
TIME DIVISION DIGITAL COMMUNICATION SYSTEM

Klaus Gueldenpfennig, Penfield, and Charles J. Breidenstein, Rochester, both of N.Y., assignors to Redcom Laboratories, Inc., Fairport, N.Y.

Filed May 29, 1979, Ser. No. 42,742

Int. Cl.[3] **H04Q** *11/04*

U.S. Cl. 370—66 **20 Claims**



11. A TDM telecommunications system for providing two-way communications between a plurality of lines, said system comprising a plurality of switching units each serving a separate group of said lines, each of said units having port means interfacing with said lines for receiving and transmitting digital signals, time slot interchange means, and processor means, a

send highway and a receive highway, said time slot interchange means, processor means and port means interfacing with each other to provide time division multiplexed receiving connections for digital signals through said time slot interchange means and receive highway, and time division multiplexed transmitting connections along said send highways to said time slot interchange means, and said switching units being in direct communication with each other via control lines interconnecting the processors thereof and said send highways interconnecting the time slot interchanges thereof.

4,228,537

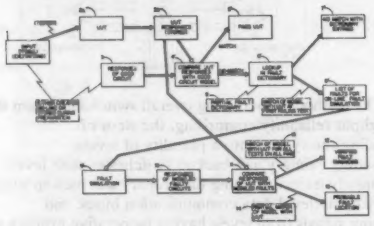
METHOD OF AND APPARATUS FOR AUTOMATIC FAULT DIAGNOSIS OF ELECTRICAL CIRCUITS EMPLOYING ON-LINE SIMULATION OF FAULTS IN SUCH CIRCUITS DURING DIAGNOSIS

Lutz Henckels, Lexington; René Haas, Cambridge, and Ralph Anderson, Carlisle, all of Mass., assignors to GenRad, Inc., Concord, Mass.

Continuation of Ser. No. 809,101, Jun. 22, 1977, abandoned, which is a continuation of Ser. No. 583,539, Jun. 4, 1975, abandoned, which is a continuation of Ser. No. 443,853, Feb. 19, 1974, abandoned. This application Aug. 29, 1978, Ser. No. 937,789

Int. Cl.[3] G01R *31/28*

U.S. Cl. 371—23 **9 Claims**



1. A method of automatic fault diagnosis of an electrical circuit under test comprising applying a set of tests to the circuit under test; comparing the responses of the circuit under test with the responses of a good circuit to detect variations which are indicative of faults; selecting from a stored partial fault dictionary of modeled circuit faults a list of possible circuit faults which are capable of producing at least one of said variations; simulating on-line circuits having at least one of the faults from said list; generating the responses of the simulated circuits to the set of tests; and comparing the responses of the simulated circuits with the responses of the circuit under test to effect fault diagnosis.

4,228,538

REAL-TIME ADAPTIVE POWER CONTROL IN SATELLITE COMMUNICATIONS SYSTEMS

Hans Scharla-Nielsen, Palm Bay, and Frank A. Perkins, Melbourne, both of Fla., assignors to Harris Corporation, Cleveland, Ohio

Filed Dec. 15, 1977, Ser. No. 860,988

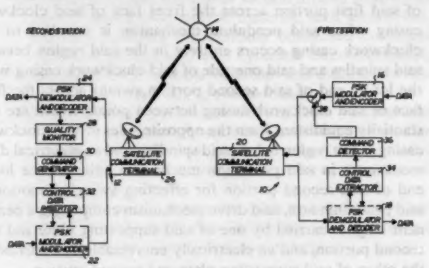
Int. Cl.[3] H04B *7/20*

U.S. Cl. 455—9 **5 Claims**

1. Apparatus for providing adaptive power control in communications systems wherein first and second stations communicate serial streams of binary data bits via a power-limited repeater having a power output which is functionally related to power input, comprising:

quality monitor means associated with said second station for providing an indication of the quality of the signal received by said second station from said first station via said power-limited repeater;

encoding means for encoding said signal quality indication onto a first serial stream of binary data bits transmitted to said first station from said second station, and including means responsive to said signal quality indication for providing a second serial stream of binary data bits in accordance therewith and having a bit rate equal to X/Nth that of said first serial stream of binary data bits, where X and N are integers and means responsive to said first and second serial streams of binary data bits for providing an output bit stream having a bit rate $(N+X)/N$ times the bit rate of said first serial stream of binary data bits, wherein $N/(N+X)$ of the bits of said output bit stream correspond to the bits of said first serial stream of binary data bits, and $X/(N+X)$ of the bits of said output bit stream correspond to the bits of said second serial stream of binary data bits, said output bit stream being



provided for transmission to said first station in place of said first serial stream of binary data bits;

decoding means associated with said first station, responsive to said output bit stream received from said second station, for extracting said signal quality indication therefrom and including means responsive to said output bit stream for separating said first and second serial streams of binary data therefrom; and

means at said first station for adjusting the power level of said signal transmitted by said first station to said second station via said repeater, in accordance with said signal quality indication as recovered by said decoding means,

whereby said signal quality indications are communicated between said stations without requiring a separate communications channel.

4,228,539

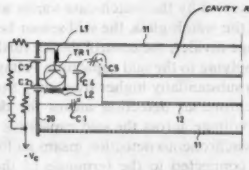
HIGH FREQUENCY TRANSMITTER

Reijo Hämäläinen, Vantaa, Finland, assignor to Valsala Oy, Finland

Filed Dec. 28, 1978, Ser. No. 973,797

Int. Cl.[2] H04B *1/03*; H03H *13/00*

U.S. Cl. 455—124 **7 Claims**



1. A high frequency transmitter comprising

a cavity resonator having an outer tube having spaced opposite ends, a coaxial inner tube spaced from and surrounded by the outer tube and an end cap coaxially rotatably mounted on said outer tube at one end thereof; and

a transistor oscillator stabilized by the cavity resonator and having components mounted on the end cap of said reso-

nator whereby the intensity with which a high frequency is applied to said resonator is adjustable by rotation of said end cap.

4,228,540

RADIO RECEIVER

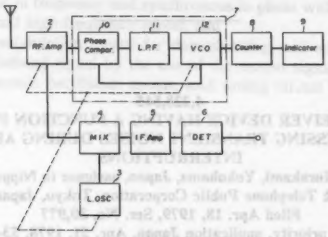
Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 6, 1978, Ser. No. 883,965

Claims priority, application Japan, Mar. 11, 1977, 52/29347[U]

Int. Cl.³ H04B 1/26

U.S. Cl. 455—158 **7 Claims**



1. In a superheterodyne radio receiver having a radio frequency stage for receiving radio wave signals, an oscillator, a mixer stage coupled to said radio frequency stage and oscillator to provide intermediate frequency signals, and detector means for demodulating said intermediate frequency signals, the improvement comprising:

a tuning circuit coupled to said radio frequency stage and responsive to a radio wave signal applied to said receiver and producing a signal of a tuned frequency equal to the frequency of said radio wave signal; a phase-locked loop circuit responsive to said tuned-frequency signal and producing an output signal having a frequency in accordance with said tuned frequency; means for varying a free-running frequency of said phase-locked loop circuit;

means for varying the tuning frequency of said tuning circuit and interlocked with said free-running frequency varying means; and

means for displaying the value of said output signal frequency of said phase-locked loop circuit.

4,228,541

DEVICE FOR THE ELECTRO-OPTICAL DISPLAY OF THE TUNING OF A TELEVISION AND/OR SOUND RADIO RECEIVER

Ole Snedkerud, Windisch, and Peter J. Wild, Wettingen, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Sep. 11, 1978, Ser. No. 941,076

Claims priority, application Switzerland, Sep. 13, 1977, 11145/77

Int. Cl.² H04B 1/26

U.S. Cl. 455—158 **11 Claims**

1. A device for the display of the name of a transmitter transmitting electromagnetic waves which are received by a receiver, such as a television or a radio, comprising:

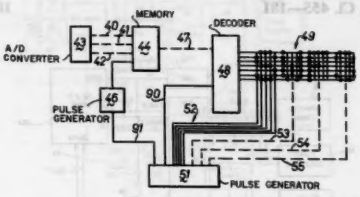
a first circuit for directly measuring the frequency of incoming electromagnetic waves to which said receiver is tuned;

an electro-optical display for displaying the name of the transmitter corresponding to the tuned electromagnetic waves received;

a memory having an input connected to an output of said first circuit, and an output, said memory comprising a plurality of memory blocks, a name of a transmitter being stored in each memory block;

display excitation means having an input connected to the output of said memory and an output connected to said electro-optical display for producing the excitation of the electro-optical display;

a second circuit measuring the amplitude of the tuned electromagnetic radiation received and for activating the electro-optical display only in the event that the measured



amplitude of the tuned electromagnetic waves received exceeds a predetermined threshold;

wherein the output signal of the first circuit is used as the address of a memory block and the contents of the addressed memory block are coupled, for control of the electro-optical display, to the input of the display excitation means.

4,228,542

DIGITAL TUNING FM STEREOPHONIC RECEIVER INCLUDING PHASE LOCKED LOOP SYNTHESIZER

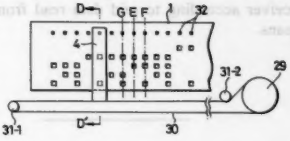
Akira Misawa, and Tatsuo Numata, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 16, 1978, Ser. No. 951,820

Claims priority, application Japan, Oct. 17, 1977, 52-123442; Oct. 21, 1977, 52-125849

Int. Cl.³ H04B 1/26; H03J 5/00

U.S. Cl. 455—174 **10 Claims**



1. In a digital tuning FM stereophonic receiver of the type including a programmable frequency divider employed in a phase locked loop synthesizer wherein a digital code is provided in order to determine a frequency division number of said programmable frequency divider, the improvement comprising:

(a) coded means carrying a plurality of arrays of code-indicating indicia;

(b) first detecting means for detecting the digital code represented by each array of indicia when in alignment therewith;

(c) latch means for storing the detected digital code in response to a latch control signal, the output of said latch means being connected to said programmable frequency divider, and the stored digital code remaining in said latch until a subsequent latch control signal is received;

(d) alignment indicating means carried on said coded means;

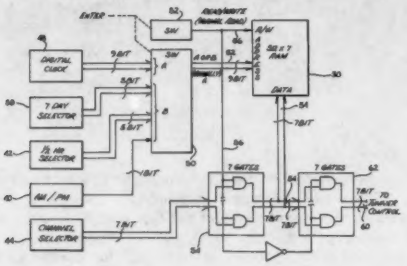
(e) second detecting means for providing an alignment output signal when aligned with said alignment indicating means, an alignment output signal from said second detecting means indicating that said first detecting means is aligned with one of said arrays of code-indicating indicia; and

(f) means for generating said latch control signal in response to said alignment output signal.

4,228,543
PROGRAMMABLE TELEVISION RECEIVER CONTROLLERS

Joseph N. Jackson, 716 S. Harvard, Apt. 126, Los Angeles, Calif. 90005

Continuation-in-part of Ser. No. 764,032, Jan. 21, 1977, Pat. No. 4,081,754. This application Mar. 24, 1978, Ser. No. 889,729
Int. Cl.[2] H04B 1/16; H01H 43/00
U.S. Cl. 455—181 18 Claims



1. A programmable television controller comprising:

a random-access memory means for storing data;

storing means for storing data corresponding to channel selections in said memory means at write-addresses corresponding to future time periods, with said storing means including a write-address for application to said memory means means for generating said write-addresses;

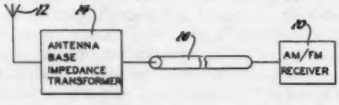
read means for reading out said data from said memory means by application of real time related read-addresses thereto when real time coincides with said future time periods and

control means for controlling the reception of a television receiver according to said data read from said memory means.

4,228,544
ANTENNA SYSTEM USING ANTENNA BASE IMPEDANCE TRANSFORMING MEANS

James H. Guyton, R.R. #1, P.O. Box 179, Syracuse, Ind. 46567

Filed Jan. 19, 1978, Ser. No. 870,961
Int. Cl.[2] H04B 1/18; H03H 7/38
U.S. Cl. 455—282 12 Claims

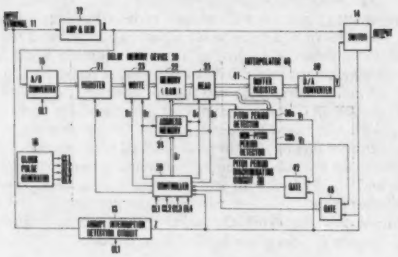


4. In combination with a receiver adapted for reception of a given frequency band, an antenna having a capacitive reactance at said frequency band, an impedance transforming means having an input connected to the antenna and having an output connected to the receiver, said impedance transforming means comprising an amplifying device having an output voltage and connected in a configuration having a common electrode circuit arranged so the output voltage is applied as a negative feedback voltage to the input of the device, and phase shift means in the output of said impedance transforming means for producing a feedback voltage substantially 180° out of phase with the voltage induced in the antenna at frequencies in said given frequency band to produce approximately 100% degeneration.

4,228,545
RECEIVER DEVICE HAVING A FUNCTION FOR SUPPRESSING TRANSIENT NOISES DURING ABRUPT INTERRUPTIONS

Hideyo Murakami, Yokohama, Japan, assignor to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 18, 1979, Ser. No. 30,977
Claims priority, application Japan, Apr. 21, 1978, 53-46691
Int. Cl.[2] H04B 1/10
U.S. Cl. 455—296 7 Claims



1. A receiver device having a function of suppressing noises during abrupt interruptions comprising:

a demodulator for demodulating speech signals received at the input terminal of the device;

memory means for storing, with a delay, the demodulated speech signals of a prescribed period for a predetermined time;

means for detecting an abrupt interruption and its period of the received speech signals;

means for discriminating whether the speech signals stored in said delay memory means are periodic or non-periodic;

an interpolator for creating interpolating information during the abrupt interruption from signals stored in the delay memory means under the control of said detection means by receiving the outputs from said discriminating means and the abrupt interruption detection means; and

switch means which is adapted, under the normal condition, to receive and transmit signals from the demodulator to the output of the device, while it is adapted, under the condition that the abrupt interruption and the period thereof is detected, to select signals from the interpolator and to transmit the selected interpolating signals to the output terminal of the device.

4,228,546

AM RADIO RECEIVER

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 23, 1978, Ser. No. 880,688
Claims priority, application Japan, Mar. 4, 1977, 52-23351
Int. Cl.[2] H04B 1/10, 1/26
U.S. Cl. 455—302 6 Claims

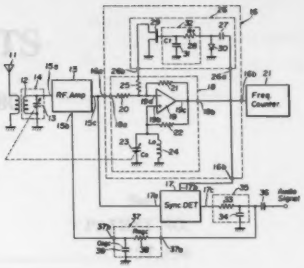
1. An AM radio receiver comprising:

(a) an antenna;

(b) a tuning circuit receiving an amplitude-modulated radio wave signal through the antenna for producing a high-frequency signal of a tuned frequency;

(c) harmonic oscillation means receiving said high-frequency signal for producing an output signal which is equal in frequency and synchronous in phase with respect to said high-frequency signal; and

(d) demodulation means for demodulating said amplitude-modulated signal by the use of the output signal of said harmonic oscillation means, said tuning circuit and said harmonic oscillation means comprising tuning-frequency varying means and oscillation-frequency varying means,



respectively, both said frequency-varying means being interlocked with each other.

DESIGN PATENTS

GRANTED OCT. 14, 1980

ERRATA

For CLASS	See PATENT NO.
D24–056	257,394
D47–006 E	257,403
D47–006 F	257,404

DESIGN PATENTS

GRANTED OCT. 14, 1980

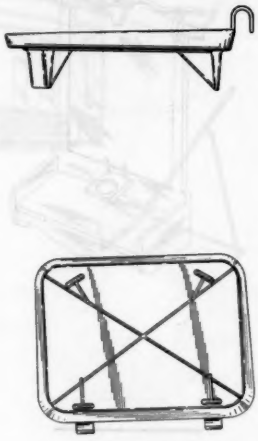
ERRATA

Pa	Ba
Cl.s/s	PATENT No.
D24-026	257,196
D47-036 F	257,671
D47-026 F	257,424

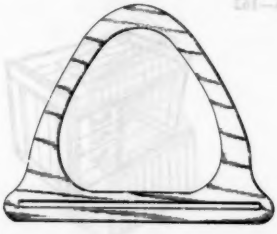
DESIGNS

OCTOBER 14, 1980

257,296
AUTOMOBILE SERVING TRAY
Robert W. White, 715 NW. 39th St., Oklahoma City, Okla. 73118
Filed Dec. 4, 1978, Ser. No. 965,771
Term of patent 14 years
Int. Cl. D3—*99*; D7—*99*
U.S. Cl. D3—40

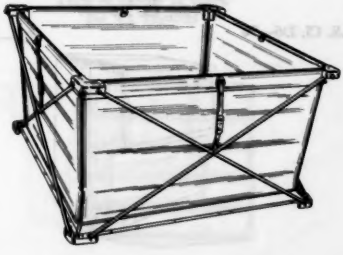


257,297
PURSE HANDLE
Bernard L. Keller, 41 Eagle La., Palm Harbor, Fla. 33563
Filed Dec. 4, 1978, Ser. No. 966,109
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—54

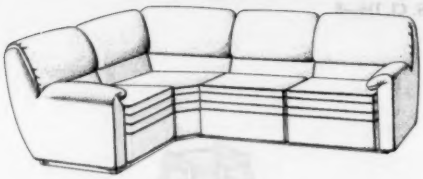


257,298
HIGH CHAIR
Oney Temple, Schaumburg, Ill., assignor to McDonald's Corporation, Oak Brook, Ill.
Filed Jan. 9, 1978, Ser. No. 868,137
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—8

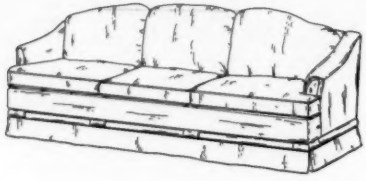
257,299
PLAYPEN
Richard E. Cone, Dayton, Ohio, assignor to Questor Corporation, Toledo, Ohio
Filed Sep. 20, 1978, Ser. No. 944,208
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—13



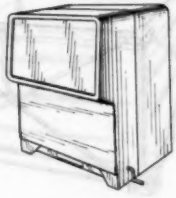
257,300
SOFA
Morris F. Fisher, N. Palm Beach, Fla., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Feb. 13, 1978, Ser. No. 877,208
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



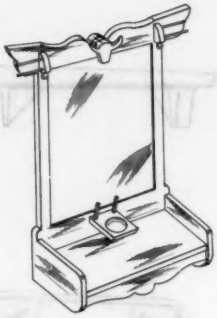
257,301
SEAT OR SIMILAR ARTICLE
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed Dec. 20, 1978, Ser. No. 971,352
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



257,302
TOWEL DISPENSING CABINET
E. Burton Benjamin, Highland Park, Ill., assignor to Mosinee Paper Corporation, Mosinee, Wis.
Filed Aug. 2, 1978, Ser. No. 930,337
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—96

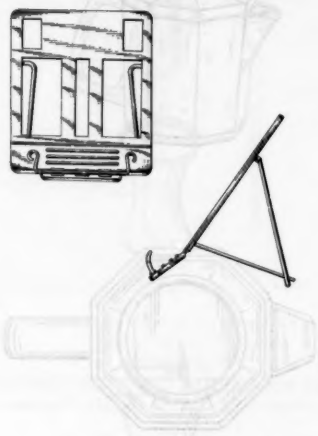


257,303
VALET WALL RACK
David Nusz, 2025 W. Mark, Layton, Utah 84041
Filed Dec. 26, 1978, Ser. No. 974,128
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—123

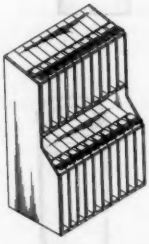


257,304
DESK OR THE LIKE
Stephen H. Robertson, 4108 Deep Hollow Dr., Apt. 277, and Randall L. Ward, 4102 Deep Hollow Dr., Apt. 284, both of Raleigh, N.C. 27612
Filed Mar. 29, 1978, Ser. No. 884,380
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—162

257,305
BOOKHOLDER
George A. Kaempkes, 1229 NE. 37th St., Pompano Beach, Fla. 33060
Filed Oct. 12, 1978, Ser. No. 951,006
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—184

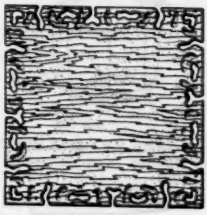


257,306
TAPE CARTRIDGE HOLDER
Michel F. Aboussouan, 8135 Clybourn Ave., Sun Valley, Calif. 91352
Filed Sep. 11, 1978, Ser. No. 941,413
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185



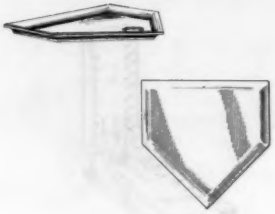
257,307
CASSETTE BOX AND RECORD HOLDER
Eduard H. Schweizer, 5101 Boarshead Rd., Apartment 133, Minnetonka, Minn. 55343
Filed Oct. 27, 1978, Ser. No. 955,722
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

257,308
TABLE TOP
Michael D. English, 2281 N. Gettysburg Ave., Dayton, Ohio 45406
Filed Nov. 25, 1977, Ser. No. 855,444
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

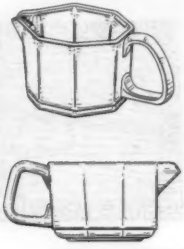


257,309
CHIROPRACTIC PILLOW, OR SIMILAR ARTICLE
Frederick H. Kroll, 72 Woodhollow La., New Rochelle, N.Y. 10804
Filed Jan. 25, 1979, Ser. No. 6,300
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201

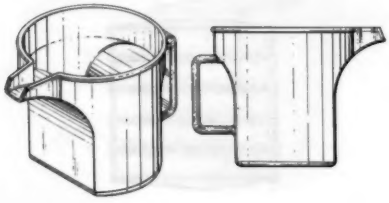
257,310
FOOD PLATE OR SIMILAR ARTICLE
Stavros Cosmopulos, 8 Bridge St., Norwell, Mass. 02061
Filed Nov. 21, 1977, Ser. No. 853,560
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—1



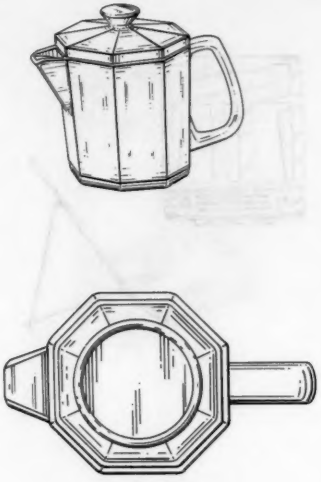
257,311
PITCHER
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 8, 1979, Ser. No. 18,822
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—64



257,312
CREAM PITCHER OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 16, 1979, Ser. No. 39,534
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—64



257,313
TEA POT
David L. Painter, Glenview, Ill., and Robert C. Zinkgraf, West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Mar. 8, 1979, Ser. No. 18,804
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—65



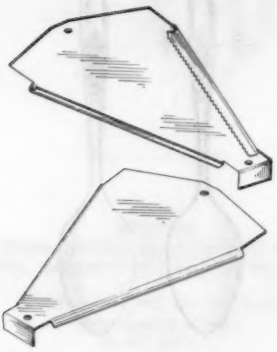
257,314
INSULATED BEVERAGE CAN HOLDER
John L. Robison, 396 9th St., and Oliver D. Abrahamson, 1196 12th St., both of Newport, Minn. 55055
Filed Sep. 29, 1978, Ser. No. 946,972
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—70

257,315
GREASE SAVER CONTAINER
David W. Keon, 665 S. Almond St., Dixon, Calif. 95620
Filed Jun. 8, 1977, Ser. No. 804,609
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79

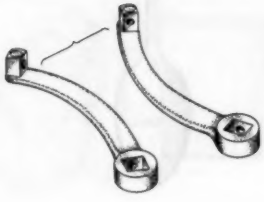
257,316
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Feb. 15, 1979, Ser. No. 12,497
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

257,317
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,465
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

257,318
JAR OPENER
Marcello Zorzi, 287 Glidden Rd., Unit 13, Brampton, Ontario, Canada (L6W 1H9)
Filed May 11, 1978, Ser. No. 905,115
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D8—18



257,319
SET OF SOCKET WRENCH EXTENSIONS
Richard T. Cremer, 312 Parkview Dr., Washington, Ill. 61571
Filed Mar. 16, 1978, Ser. No. 887,452
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—29



257,320
AUTOMOBILE ANTI-THEFT DEVICE
Arthur E. Weisberg, 6473 Westchester Cir., Minneapolis, Minn. 55427
Filed Sep. 29, 1978, Ser. No. 941,041
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—343

257,321
SUPPORT FOR CABLES, TUBING OR THE LIKE
James M. Voorhees, Jr., 3921 River Club Rd., Edgewater, Md. 21037
Filed Jun. 1, 1978, Ser. No. 911,302
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

257,322
BRACKET PLATE
Franklin D. Pichelman, and Donald N. Mehl, both of Minnetonka, Minn., assignors to Flo-Pac Corporation, Minneapolis, Minn.
Filed Jan. 29, 1979, Ser. No. 7,379
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—354

257,323

HALYARD STOPPER

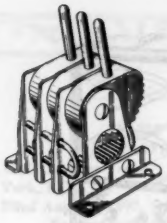
Carl A. Merry, Marion, Mass., assignor to Schaefer Marine, Inc., New Bedford, Mass.

Filed Mar. 13, 1978, Ser. No. 885,790

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—383



257,324

TUBE SUPPORTING CLIP

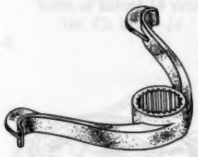
Marvin E. Huff, Jr., 2516 Carnoustie Ct., Union City, Calif. 94587

Filed Mar. 20, 1978, Ser. No. 888,674

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—396



257,325

COMBINED PARTING BEAD EXTENDER AND WEATHER STRIP CONNECTOR FOR WINDOW INSTALLATIONS

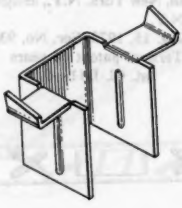
Barry M. Jones, Berwyn, Pa., assignor to Q. C. Glide Company, Sharon Hill, Pa.

Filed May 11, 1978, Ser. No. 905,421

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—400



257,326

BOTTLE OR SIMILAR ARTICLE

Gerald C. Wojta, Columbus, Ohio, assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 27, 1978, Ser. No. 901,281

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—40

257,327

RAZOR DISPLAY PACKAGE

Rolf A. Samsing, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

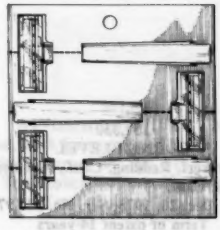
Filed Jan. 12, 1978, Ser. No. 868,844

The portion of the term of this patent subsequent to Jun. 10, 1997, has been disclaimed.

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—186



257,328

ELECTRONIC METAL WALL SCANNER

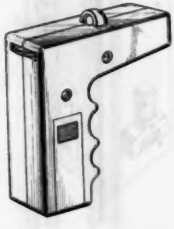
Frederic W. Schwartz, 338 Rochambeau Ave., Providence, R.I. 02906

Filed Jul. 10, 1978, Ser. No. 923,470

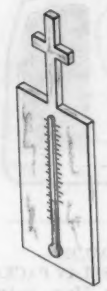
Term of patent 14 years

Int. Cl. D10—*04*

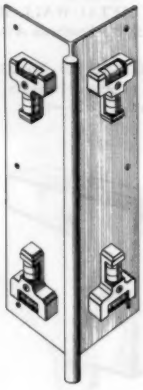
U.S. Cl. D10—47



257,329
THERMOMETER
David T. Langley, Jr., 4632 N. 9th St., Philadelphia, Pa. 19140
Filed Dec. 28, 1978, Ser. No. 974,143
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—54



257,330
CORNER LEVEL
Robert H. VanderWerf, Redding, Calif., assignor to Vy-Dawn, Inc., San Rafael, Calif.
Filed Dec. 28, 1978, Ser. No. 973,974
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69



257,331
ENGINE EXHAUST EMISSION ANALYZER
James R. Shaffer, Mt. Prospect; David E. Maxwell, Cary, and Lee F. Radtke, Lake Zurich, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.
Filed Jul. 28, 1978, Ser. No. 928,889
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—81

257,332
COMBINED GAUGE AND MOUNTING BLOCK
Aubrey L. Lewis, Rte. 1, Box 53L, Frisco, Tex. 75034
Filed Nov. 9, 1978, Ser. No. 959,429
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—85

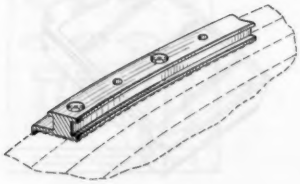
257,333
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,748
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

257,334
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,763
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

257,335
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,770
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

257,336
SKI SCOOTER
Joe Brumbt, 9008 Tomahawk Blvd., Omaha, Nebr. 68134
Filed Jul. 2, 1979, Ser. No. 53,842
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—8

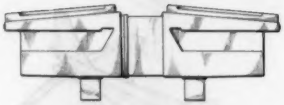
257,337
TOE-RAIL
Warren M. Black, Newbury, Ohio, assignor to Merriman Holbrook, Inc.
Filed Nov. 13, 1978, Ser. No. 959,686
Term of patent 14 years
Int. Cl. D12—*16, 03*
U.S. Cl. D12—70



257,338
AIRCRAFT
Jean W. McComas, West Islip, and Gordon Rosenthal, Jericho, both of N.Y., assignors to Fairchild Industries, Inc., Germantown, Md.
Filed Nov. 9, 1978, Ser. No. 959,139
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78

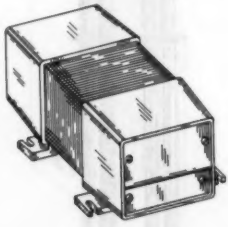
257,339
WINDSHIELD WIPER UNIT
Paul Ellinwood, 1618 Fairway Dr., Clinton, Iowa 52732
Continuation-in-part of Ser. No. 847,317, Oct. 31, 1977, abandoned. This application Nov. 23, 1979, Ser. No. 97,057
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

257,340
ADJUSTABLE CONTAINER FOR A PICK-UP TRUCK OR THE LIKE
Robert D. Grossman, 22 Rivo Alto Dr., Miami Beach, Fla. 33139
Filed Jan. 22, 1979, Ser. No. 5,529
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157

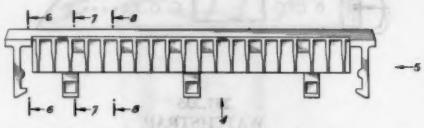


257,341
LICENSE PLATE HOLDER
Steffan E. Blaser, 918 W. 6th, Benicia, Calif. 94510
Filed Oct. 2, 1978, Ser. No. 947,932
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—193

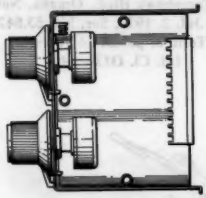
257,342
ELECTRICAL TRANSFORMER
George L. Payne, 345 Bedford Center Rd., Bedford Hills, N.Y. 10507
Filed Dec. 11, 1978, Ser. No. 968,593
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4



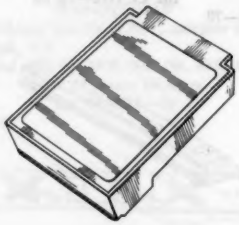
257,343
ACTUATOR BAR FOR A ZERO INSERTION FORCE CONNECTOR, OR THE LIKE
Gene C. Hollingsworth, Cerritos, Calif., assignor to Zero Corporation, El Monte, Calif.
Filed Jun. 5, 1978, Ser. No. 912,575
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



257,344
LIMIT SET MODULE
Seymour Barth, Searingtown, N.Y., assignor to Astrosystems, Inc., New York, N.Y.
Filed Jun. 8, 1978, Ser. No. 913,881
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—32



257,345
PLUG-IN MEMORY MODULE CARTRIDGE FOR ELECTRONIC TRANSLATOR, CALCULATOR AND INFORMATION RETRIEVAL DEVICE
Michael Levy, Plantation, Fla., assignor to Lexicon Corporation, Miami, Fla.
Filed Nov. 17, 1978, Ser. No. 964,066
Term of patent 14 years
Int. Cl. D14—*02, 99*
U.S. Cl. D14—11

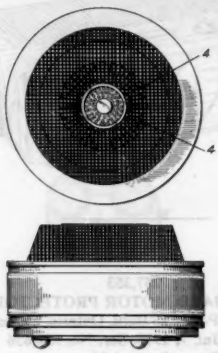


257,346

CONFERENCE MICROPHONE

Charles R. Garrigus; Gary L. Over, and Henry J. Cvetko, all of Conneaut, Ohio, assignors to The Astatic Corporation, Conneaut, Ohio

Filed May 22, 1978, Ser. No. 908,138
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—12

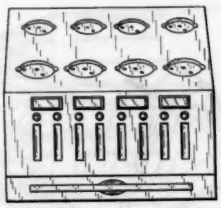


257,347

COMBINED CODED DIGITAL DISC PHONOGRAPH AND STORAGE UNIT OR THE LIKE

Robert W. Lester, Manhasset, N.Y., assignor to Sonadisc, Inc., New York, N.Y.

Filed May 11, 1978, Ser. No. 904,944
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—20

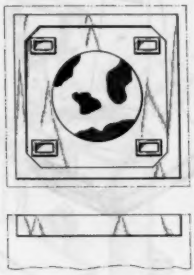


257,348

FACE PLATE FOR A LOUD SPEAKER CABINET OR SIMILAR ARTICLE

Michael T. Sansone, Jr., 156 Suellen Dr., Rochester, N.Y. 14609

Filed Jul. 19, 1978, Ser. No. 926,137
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. 14—39

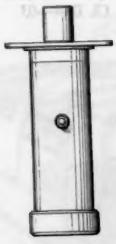


257,349

HAND HELD TAPE WINDER

Ronald B. Thomas, Delano, Minn., assignor to Computer Products Corporation, Edina, Minn.

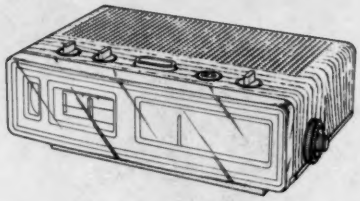
Filed May 24, 1978, Ser. No. 908,994
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—40



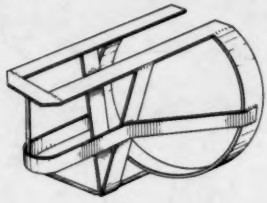
257,350
LOUDSPEAKING TELEPHONE HOUSING
George M. Janda, Westchester, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Dec. 21, 1978, Ser. No. 971,989
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

257,351
RADIO RECEIVER
Toshimasa Akazawa, Ashiya; Munenori Fujimoto, Neyagawa; Kikuo Ohta, Ikoma, and Benito Mishiro, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 27, 1978, Ser. No. 946,856
Claims priority, application Japan, Apr. 4, 1978, 53-13248
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

257,352
DIGITAL CLOCK RADIO
Katsuhiko Makino, and Kanzi Kosugi, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jul. 20, 1977, Ser. No. 817,285
Claims priority, application Japan, Jan. 20, 1977, 52-1470
Term of patent 14 years
Int. Cl. D14—*03;* D10—*01*
U.S. Cl. D14—73



257,353
OUTBOARD MOTOR PROTECTOR
Fiorevante Fogolin, Pointe au Baril, Ontario, Canada (P0G 1K0)
Filed Jul. 7, 1978, Ser. No. 922,636
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—4



257,354
PORTABLE TIRE INFLATING UNIT
Darrell D. Fish, Timonium, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.
Filed Mar. 13, 1978, Ser. No. 886,616
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9

257,355

MOTORIZED BASE FOR USE IN DEVELOPING PHOTOGRAPHIC PRINTS

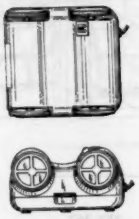
Darwin E. Chapman, Palo Alto, Calif., assignor to Creative Phototronics, Inc., Mountain View, Calif.

Filed Mar. 27, 1978, Ser. No. 890,830

Term of patent 14 years

Int. Cl. D16—*04*

U.S. Cl. D16—33



257,356

MOVIE LAMP OR SIMILAR ARTICLE

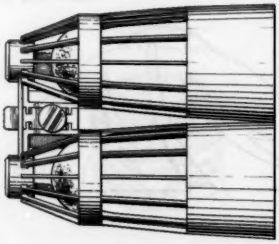
Warren H. Young, Marshfield; Nolan A. Drevitch, South Easton, and Anthony G. Rosati, Salem, all of Mass., assignors to Polaroid Corporation

Filed Sep. 20, 1978, Ser. No. 944,326

Term of patent 14 years

Int. Cl. D16—*05*

U.S. Cl. D16—42



257,357

BODY OF A TISSUE CULTURE MICROSCOPE

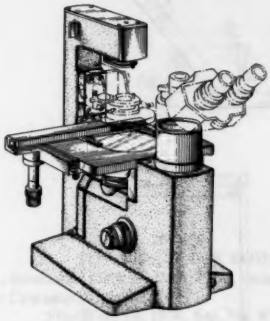
John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 18, 1978, Ser. No. 897,464

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—58



257,358

BODY AND ILLUMINATOR OF A TISSUE CULTURE MICROSCOPE

John T. Armbruster, Niagara Falls, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

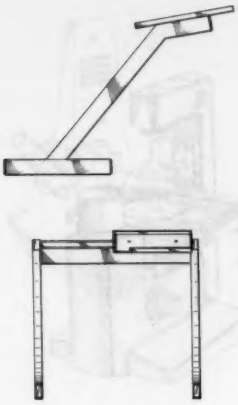
Filed Apr. 18, 1978, Ser. No. 897,465

Term of patent 14 years

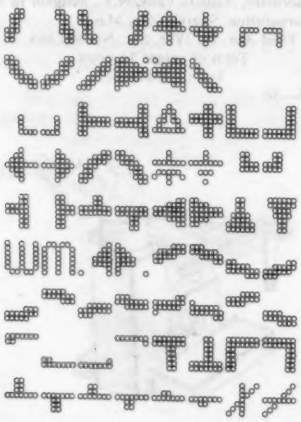
Int. Cl. D16—*06*

U.S. Cl. D16—58

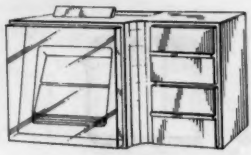
257,359
PRINTER STAND
Kenneth A. Lloyd, Jr., 10192 Orchard Park, West Dr., Indianapolis, Ind. 46280
Filed Jan. 26, 1978, Ser. No. 872,592
Term of patent 14 years
Int. Cl. D6—*04;* D14—*02;* D18—*02*
U.S. Cl. D18—23



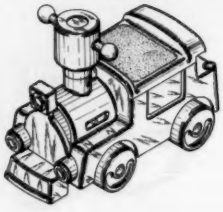
257,360
FONT OF CHARACTERS FOR FORMING A GRAPHIC DISPLAY
James J. McCarthy, Glendale, Ariz., and Joseph M. Wozniak, Scottsdale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 17, 1978, Ser. No. 879,008
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—26



257,361
COMBINED PERPETUAL CALENDAR AND CONTAINER FOR STATIONERY ARTICLES AND THE LIKE
Albert Leung, Kowloon, Hong Kong, assignor to Kenki (Hong Kong) Limited, Kowloon, Hong Kong
Filed Aug. 1, 1978, Ser. No. 930,004
Claims priority, application United Kingdom, Feb. 2, 1978, 983190/78
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—21



257,362
TOY VEHICLE
Goro Imura, Tateishi, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 8, 1978, Ser. No. 958,946
Claims priority, application Japan, Jun. 10, 1978, 53-24238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21-87



257,363
AERIAL TOY
James Collins, 7710 Watson St., Philadelphia, Pa. 19111, and Joseph Gerstenbacher, 2435 46th St., Pennsauken, N.J. 08110
Filed Dec. 30, 1977, Ser. No. 865,928
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—86

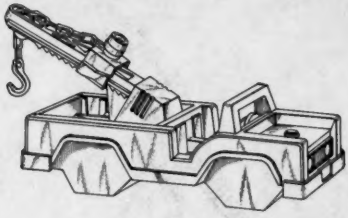
257,364
PINWHEEL
Lester V. Molenaar, Willmar, Minn., assignor to James Industries, Inc., Hollidaysburg, Pa.
Filed Aug. 17, 1978, Ser. No. 934,526
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—93

257,365
JOINT ELEMENT FOR CONSTRUCTION SET
Richard J. Gabriel, Portland, Oreg., assignor to Matrix Toys, Beaverton, Oreg.
Filed May 8, 1978, Ser. No. 903,980
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108

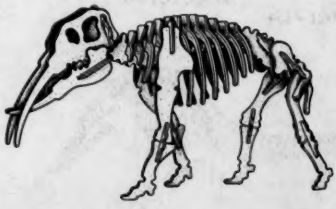
257,366
JOINT ELEMENT FOR CONSTRUCTION SET
Richard J. Gabriel, Portland, Oreg., assignor to Matrix Toys, Beaverton, Oreg.
Filed Feb. 8, 1979, Ser. No. 10,216
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—108

257,367
TOY AMBULANCE
Patrick T. A. Burdock, Broadstairs, England, assignor to Rovex Limited, London, England
Filed Jul. 11, 1978, Ser. No. 923,740
Claims priority, application United Kingdom, Jan. 13, 1978, 984237/78
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

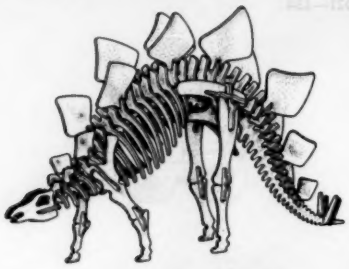
257,368
TOY TOW TRUCK BODY
Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,848
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—139



257,369
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,811
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154



257,370
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,813
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

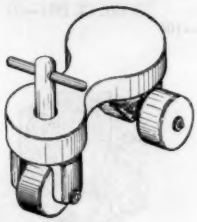


257,371
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,838
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

257,372
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,839
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

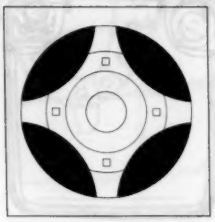
257,373
DINOSAUR FIGURE
Tatuya Kodaka, 25-6, 1-Chome, Wakamiya, Nakano-ku, Tokyo, Japan
Filed Nov. 17, 1978, Ser. No. 961,840
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—154

257,374
TOY VEHICLE OR SIMILAR ARTICLE
John R. Nottingham, 2997 Washington Blvd., Cleveland Heights, Ohio 44118, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Nov. 20, 1978, Ser. No. 962,298
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—80



257,375
SIMULATIVE TOY VEHICLE OR SIMILAR ARTICLE
John R. Nottingham, 2997 Washington Blvd., Cleveland Heights, Ohio 44118, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Filed Aug. 9, 1978, Ser. No. 932,210
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—74

257,376
GUN TARGET
Charles R. Dulude, 33 Burnside Ave., East Hartford, Conn. 06108
Filed Apr. 7, 1978, Ser. No. 894,643
Term of patent 14 years
Int. Cl. D22—*04*
U.S. Cl. D22—15



257,377
HEXAGONAL FLOATING LIVE BAIT CONTAINER
Del Andrews, 1238 Hermosa Ave., Hermosa Beach, Calif. 90254
Filed Jun. 8, 1978, Ser. No. 913,751
Term of patent 14 years
Int. Cl. 22—*05*
U.S. Cl. D22—22

257,378
FLOATING LIVE BAIT CONTAINER
Del Andrews, 1238 Hermosa Ave., Hermosa Beach, Calif. 90254
Filed Jun. 8, 1978, Ser. No. 913,752
Term of patent 14 years
Int. Cl. 22—*05*
U.S. Cl. D22—22

257,379
FISHING ROD GRIP
Hideo Nakamura, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Oct. 11, 1978, Ser. No. 950,341
Claims priority, application Japan, Jun. 1, 1978, 53-22745
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

257,380
FISHING ROD GRIP
Hideo Nakamura, Koganei, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Oct. 11, 1978, Ser. No. 950,342
Claims priority, application Japan, Jun. 1, 1978, 53-22744
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

257,381
FISHING JIG
Hiroshi Yano, 18-17, 2-chome, Terazuka, Minami-ku, Fukuoka, Japan
Filed Oct. 4, 1977, Ser. No. 839,241
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

257,382

SPINNER ASSEMBLY FOR FISHING LURE

William O. Williams, Jr., Rte. 2, Box 172, Clover, S.C. 29710

Filed Oct. 10, 1978, Ser. No. 949,695

Term of patent 14 years

Int. Cl. D22—*05*

U.S. Cl. D22—27

257,383

FISHERMAN'S TOOL

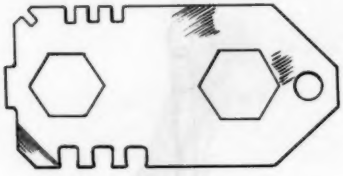
Betty B. Davenport, Texarkana, Ark., assignor to Davco Fishing Products, Texarkana, Ark.

Filed Nov. 29, 1978, Ser. No. 964,732

Term of patent 14 years

Int. Cl. D22—*05*

U.S. Cl. D22—31



257,384

MODULAR MULTI-COLOR PAINT SELECTION AND SUPPLY SYSTEM MANIFOLD OR THE LIKE

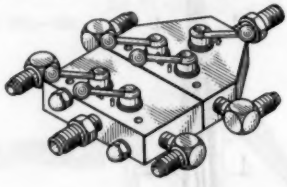
Robert D. Hetherington, Sunland, and David W. Goelz, Burbank, both of Calif., assignors to Poly-Glas Systems

Filed Nov. 20, 1978, Ser. No. 962,355

Term of patent 14 years

Int. Cl. D23—*01*

U.S. Cl. D23—40



257,385

TOILET

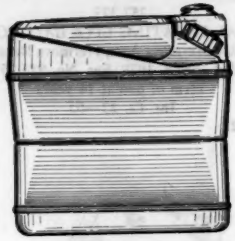
Frank T. Sargent; John M. Antos; Arthur W. Henke, all of Ann Arbor, and John A. Hoffman, Brighton, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Oct. 27, 1978, Ser. No. 955,151

Term of patent 14 years

Int. Cl. D23—*02*

U.S. Cl. D23—48



257,386

TOILET RISER

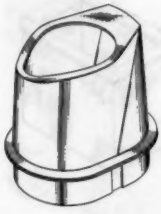
David B. Bogan, 15587 N. Bank Rd., Roseburg, Oreg. 97470

Filed Aug. 4, 1978, Ser. No. 931,112

Term of patent 3½ years

Int. Cl. D23—*02*

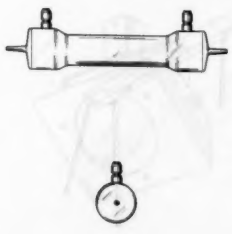
U.S. Cl. D23—69



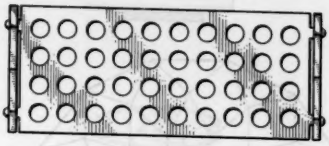
257,387
DENTAL TRAY
Floyd E. Skarky, 2233 NW. 46th, Oklahoma City, Okla. 73112
Filed Aug. 7, 1978, Ser. No. 931,822
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

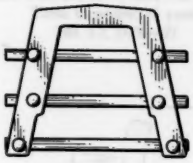
257,388
ACUITY PROJECTOR OR SIMILAR ARTICLE
Paul A. Jordan, Fairport, N.Y., assignor to Bausch & Lomb Incorporated
Filed Jun. 28, 1978, Ser. No. 919,653
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

257,389
DIALYZER
Henry Pande, Parker, Colo., assignor to Hospal Medical Corporation, Littleton, Colo.
Filed Mar. 13, 1978, Ser. No. 885,693
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—21



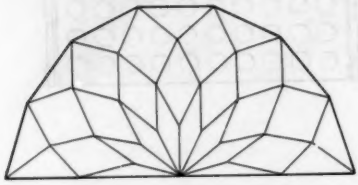
257,390
TEST TUBE RACK
Heinz W. Hahn, Rochester, and Ravinder C. Mehra, Fairport, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.
Filed Jul. 7, 1978, Ser. No. 922,810
Term of patent 14 years
Int. Cl. D6—*04*; D24—*02*
U.S. Cl. D24—32



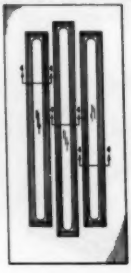


257,391
CARDIO COMPRESSOR
Samuel L. Gammon, 1169 Bryn Mawr, Daytona Beach, Fla. 32014
Filed Jan. 23, 1978, Ser. No. 871,469
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—36

257,392
SOUND SHELL STRUCTURE
John P. Goodman, The Patch Rd., Kallista, Victoria, Australia
Filed Jul. 28, 1978, Ser. No. 929,111
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—18



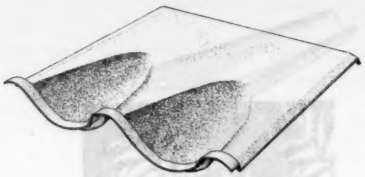
257,393
METAL DOOR
George S. Hull, and Raymond E. Imperial, both of Richmond, Ind., assignors to Johnson Sheet Metal Works Corp., Dallas, Tex.
Filed Mar. 29, 1978, Ser. No. 891,477
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



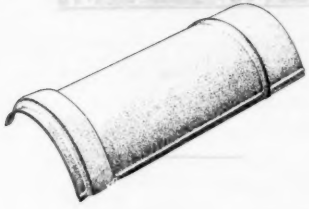
257,394
AMPULE CUVETTE
Allen S. Reichler, Dallas, Tex., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Jul. 13, 1978, Ser. No. 924,254
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—56

257,395
SAWHORSE
William L. Correll, 333 N. Basin St., Ephrata, Wash. 98823
Filed Apr. 28, 1978, Ser. No. 901,266
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D25—67

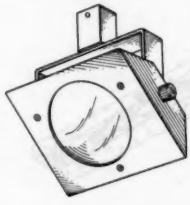
257,396
BUILDING SHEET AND THE LIKE
Erik Gustafsson, Myntvägen 14, S-951 45 Lulea, Sweden
Filed Nov. 13, 1978, Ser. No. 946,683
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—80



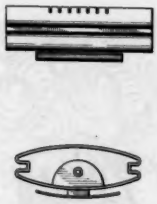
257,397
BUILDING SHEET AND THE LIKE
Erik Gustafsson, Myntvägen 14, S-951 45 Luleå, Sweden
Filed Nov. 13, 1978, Ser. No. 946,684
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—80



257,398
OVERHEAD TRACK LIGHT
John A. Tedesco, San Francisco, Calif., assignor to The Phoebus Company, Inc.
Filed Jul. 24, 1978, Ser. No. 927,023
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—85



257,399
LAMP SHADE
Hans von Klier, Milan, Italy, assignor to Skipper S.p.A., Milan, Italy
Filed Jun. 23, 1978, Ser. No. 918,660
Claims priority, application Italy, Jan. 18, 1978, 20498 A/78
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—118

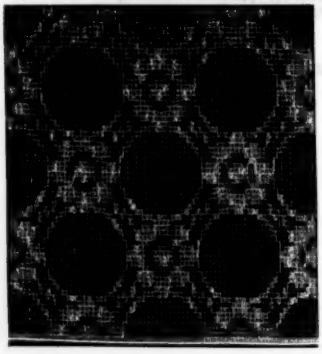


257,400
MASCARA APPLICATION AID
Bette Cunningham, 10916 Peach Grove, North Hollywood, Calif. 91601
Filed Oct. 23, 1978, Ser. No. 953,657
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

257,401
SHAVER
Richard Antretter, Stockdorf, and Werner Siersch, Soecking, both of Fed. Rep. of Germany, assignors to Rian-Apparate - und Vorrichtungsbau GmbH, Gauting, Fed. Rep. of Germany
Filed Dec. 18, 1978, Ser. No. 970,183
Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 11369
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49

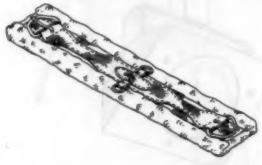
257,402
DENTAL FLOSS DISPENSER
David H. Denton, 20172 Santiago Canyon Rd., Orange, Calif. 92669, and David D. Purdom, 2626-C N. Tustin Ave., Santa Ana, Calif. 92705
Filed Oct. 31, 1978, Ser. No. 956,250
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D28—64

257,403
CURTAIN MATERIAL
Hans Stöcker, Fuerstenlandstrasse 49, CH-9500 Wil, Switzerland
Filed Feb. 28, 1978, Ser. No. 882,966
Term of patent 14 years
Int. Cl. D5—*02, 05*
U.S. Cl. D47—6 E



257,404
CURTAIN MATERIAL
Hans Stöcker, Fuerstenlandstrasse 49, CH-9500 Wil, Switzerland
Filed Feb. 28, 1978, Ser. No. 882,968
Term of patent 14 years
Int. Cl. D5—*02, 05*
U.S. Cl. D47—6 F

257,405
SADDLE CINCH
Thomas G. Land, P.O. Box 145, Cranfills Gap, Tex. 76637
Filed Jan. 5, 1979, Ser. No. 1,268
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—19

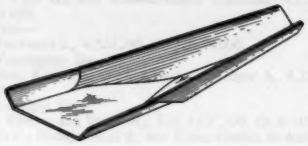


257,406

PET LITTER RETRIEVER

Dawn Ouellette, 336 E. 30th St., New York, N.Y. 10016

Filed Mar. 8, 1978, Ser. No. 884,726
Term of patent 14 years
Int. Cl. D30—*99*; D15—*99*
U.S. Cl. D30—99

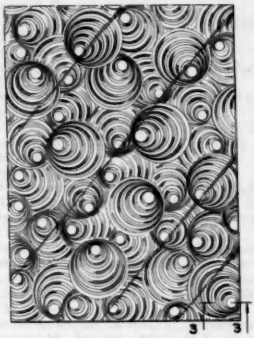


257,407

GLASS SHEET MATERIAL

Jo Maahsen, A. Feuerbachstrasse 10, 5102 Wurselen, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,862
Claims priority, application France, Nov. 8, 1977, 77 40748
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—31



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A/S Niro Atomizer: *See*—
Larsson, Finn H.; and Schwartzbach, Christian, 4,227,896, Cl. 55-260.000.

A-T-O Inc.: *See*—
Knox, Raymond L., 4,228,390, Cl. 320-38.000.

AB Bahco Ventilation: *See*—
Gustavsson, Karl-Axel G.; and Persson, Holger A., 4,227,903, Cl. 55-302.000.

AB Bahco Verktyg: *See*—
Jansson, Conny; and Wahlberg, Ulf, 4,227,430, Cl. 81-177.00M.

Abbe, Robert C.; Poduje, Noel S.; and Klein, Daniel, to Ade Corporation. Second order correction in linearized proximity probe. 4,228,392, Cl. 324-61.00R.

Abbruzzese, Luigi: *See*—
Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, 4,228,101, Cl. 260-561.0HL.

Abe, Kiyoshi: *See*—
Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, 4,228,429, Cl. 340-632.000.

Abe, Luis A. P. Nozzle for use on the exhaust of internal combustion engines. 4,227,651, Cl. 239-428.000.

Abe, Takeshi: *See*—
Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, 4,228,429, Cl. 340-632.000.

Abraham, Ludwig; and Moschetti, Armando, to Brown, Boveri & Cie AG. Control method for a three-phase self-excited inverter. 4,228,491, Cl. 363-41.000.

Abramovich, Abe, to RCA Corporation. Relative humidity measurement. 4,227,411, Cl. 73-336.500.

Acevedo, Hernan F.; Slifkin, Malcolm; and Dalbow, Milton H., to International Radioimmune Systems, Inc. Kit for detecting human chorionic gonadotropin. 4,228,127, Cl. 422-61.000.

Ackermann, Rolf; Kolb, Heinz; Morlock, Gerhard; and Schreyer, Gerd, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of glycidyl methacrylate. 4,228,084, Cl. 260-348.120.

Adair, Reginald J. Road traction apparatus. 4,227,562, Cl. 152-214.000.

Adams, Frederick J., to Cam Gears Limited. Fluid pressure control valves. 4,227,549, Cl. 137-625.690.

Ade Corporation: *See*—
Abbe, Robert C.; Poduje, Noel S.; and Klein, Daniel, 4,228,392, Cl. 324-61.00R.

Adler, Alan J. Amusement device. 4,227,326, Cl. 40-527.000.

Adolph Saurer Limited: *See*—
Oesterle, Gerhard, 4,227,825, Cl. 403-322.000.

Adrian, Werner. Apparatus for measuring the concentration of gases. 4,228,352, Cl. 250-343.000.

Advance Mining Products, Inc.: *See*—
Denny, John L.; and Alley, Robert H., 4,227,660, Cl. 242-86.520.

AFG Industries, Inc.: *See*—
Cooke, William C., 4,228,425, Cl. 340-550.000.

AGA Aktiebolag: *See*—
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,227,802, Cl. 356-5.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Jouve, Hubert; Meyer, Robert; Sztern, Jacques; Krishnan, Ramanathan; Suran, Gabor; and Tessier, Michel, 4,227,947, Cl. 148-122.000.

AGFA-Gevaert, A.G.: *See*—
Massengeil, Hans A.; Bock, Georg; and Steinlehner, Fritz, 4,227,803, Cl. 355-50.000.
Thate, Kurt, 4,227,702, Cl. 277-34.300.

Aginsky, Jacob. Intramedullary retraction nail for fixation of comminuted fractured bones. 4,227,518, Cl. 128-92.0BC.

Aguiar, Robert H. Cast cutting system. 4,227,517, Cl. 128-91.00A.

Air Products and Chemicals, Inc.: *See*—
Pippin, Wallace H.; and Daniels, Wiley E., 4,228,047, Cl. 260-17.4ST.

Aizawa, Hiroshi; Shimizu, Masami; Uchidoi, Masanori; Tsunekawa, Tokuichi; Iura, Yukio; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Bulb photographing control system for an electric shutter camera. 4,227,787, Cl. 354-51.000.

Aizawa, Hiroshi: *See*—
Shimizu, Masami; and Aizawa, Hiroshi, 4,227,788, Cl. 354-60.00R.

Ajinomoto Company, Incorporated: *See*—
Hiraga, Hirofumi; Miyajima, Ryuichi; and Mitsugi, Koji, 4,228,241, Cl. 435-212.000.

Akitomo, Nobuo: *See*—
Tohyama, Shigeo; and Akitomo, Nobuo, 4,227,811, Cl. 356-325.000.

Aktiebolaget Atomenergi: *See*—
Margen, Peter H. E.; Roseen, Rutger A.; and Zinko, Heimo, 4,227,511, Cl. 126-415.000.

Akzona Incorporated: *See*—
Dawson, Edward C.; Homan, Jan D. H.; and Van Weemen, Bauke K., 4,228,240, Cl. 435-188.000.

Albert, Ernst, to Deutsche Star Kugelhalter GmbH. Ball bushing with axial extending ball guides. 4,227,751, Cl. 308-6.00C.

Albrecht, Leman P.; and Willis, W. Coy, to Aluminum Company of America. Container closure. 4,227,617, Cl. 215-251.000.

Alden Research Foundation: *See*—
Williams, George C., 4,228,443, Cl. 346-165.000.

Alexander, John B.; Dennehey, T. Michael; Greff, Richard J.; and Munsch, John M., to Baxter Travenol Laboratories, Inc. Gripper member for retention of a plastic tube. 4,227,730, Cl. 294-16.000.

Alexandrov, Adolf M.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A., 4,227,451, Cl. 100-295.000.

Alexeev, Gennady M.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A., 4,227,451, Cl. 100-295.000.

Alfio, Deregibus, to Goodyear Tire & Rubber Company, The. Autoclave for thermally treating very long rubbery hose products, and the like. 4,228,134, Cl. 422-208.000.

Alfthan, Bjorn J. V.; and Pettersson, Karl G. Method and an arrangement for obtaining a translatory movement between two mutually contacting bodies. 4,227,608, Cl. 198-630.000.

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Allan, Geoffrey: *See*—
Eakins, Kenneth E.; and Allan, Geoffrey, 4,228,176, Cl. 424-273.00R.

Allen-Bradley Company: *See*—
Bernhard, Theodore L.; Dummermuth, Ernst; Hoch, Thomas M.; Jaffe, Bruce S.; and Merrell, Gregory L., 4,228,495, Cl. 364-101.000.

Allen, Donald L., to Don Allen, Inc. Replication apparatus. 4,227,557, Cl. 142-7.000.

Alley, Robert H.: *See*—
Denny, John L.; and Alley, Robert H., 4,227,660, Cl. 242-86.520.

Allied Chemical Corporation: *See*—
Patel, Gordhanbhai N.; and Yee, Kwok C., 4,228,126, Cl. 422-56.000.
Pez, Guido, 4,228,060, Cl. 260-30.40R.
Taub, Bernard; Harnish, Daniel F.; and Jones, Philip E., 4,228,246, Cl. 521-98.000.

Allis-Chalmers Corporation: *See*—
Caldwell, Robert A., 4,228,337, Cl. 219-73.100.
Caldwell, Robert A., 4,228,342, Cl. 219-137.0WM.

Allor Foundation, The: *See*—
Swanson, Damon, 4,228,238, Cl. 435-32.000.

Alsen, Klaus; Neidhardt, Hans; Maletzke, Jurgen; and Wimmer, Johann, to Dyckerhoff & Widmann Aktiengesellschaft. Method for the construction of elongated concrete structures such as bridges and the like. 4,228,114, Cl. 264-33.000.

Altschul, Barry: *See*—
Neumann, George J.; and Altschul, Barry, 4,227,765, Cl. 339-143.00R.

Aluminum Company of America: *See*—
Albrecht, Leman P.; and Willis, W. Coy, 4,227,617, Cl. 215-251.000.

Amend, William E.; and Studhalter, Walter R., to Biphase Energy Systems, Inc. Waste heat recovery cycle for producing power and fresh water. 4,227,373, Cl. 60-618.000.

Amerace Corporation: *See*—
Heenan, Sidney A., 4,227,772, Cl. 350-103.000.

American Associated Companies: *See*—
McNelley, H. William, Jr., 4,227,277, Cl. 15-229.00R.

American Can Company: *See*—
Hein, Carl C., III; Lempke, Russell J.; Silver, Harold K.; Spitz, Joseph J.; and Seidler, Don W., 4,228,215, Cl. 428-216.000.
Rohowetz, Stanley E., 4,228,221, Cl. 428-469.000.

American Color & Chemical Corporation: *See*—
Huffman, Allan M., 4,227,879, Cl. 8-602.000.

American Cyanamid Company: *See—*
Bezwada, Rao S., 4,228,045, Cl. 260-4.00R.
Blake, David W.; Delgado, Alberto W.; and Sheehan, Gerard M., 4,227,935, Cl. 106-308.00B.
Chen, Sow-Mei L.; and Grudzinskas, Charles V., 4,228,298, Cl. 560-121.000.
Granzow, Albrecht H., 4,228,063, Cl. 260-45.70P.
Grudzinskas, Charles V.; and Weiss, Martin J., 4,228,296, Cl. 560-60.000.
Kupleian, Robert H., 4,227,913, Cl. 71-78.000.
Lawhorne, Earl R., 4,227,934, Cl. 106-300.000.
O'Neal, Thomas D., 4,227,912, Cl. 71-78.000.

American District Telegraph Company: *See—*
Guscott, John K.; Renner, Gerard; and Wendt, Roger, 4,228,379, Cl. 310-322.000.

American Optical Corporation: *See—*
Deeg, Emil W., 4,227,910, Cl. 65-269.000.
Goodwin, Bertram R.; and Canterbury, Bradford, 4,227,673, Cl. 249-117.000.

American Petro Mart, Inc.: *See—*
Carlson, Lee G., 4,228,001, Cl. 210-676.000.

American Science and Engineering, Inc.: *See—*
Annis, Martin, 4,228,357, Cl. 250-445.00T.

Ameron, Inc.: *See—*
Law, Gabriel H.; and Gysegem, Albert P., 4,227,929, Cl. 106-1.170.

AMF Incorporated: *See—*
Sherwood, John R., 4,228,475, Cl. 361-47.000.

AMP Incorporated: *See—*
Marks, Richard L., 4,227,763, Cl. 339-99.00R.

Anantha, Narasipur G.; Henle, Robert A.; and Walsh, James L., to International Business Machines Corporation. Integrated circuit interconnection structure having precision terminating resistors. 4,228,369, Cl. 307-270.000.

Anantha, Narasipur G.; and Chang, Augustine W., to International Business Machines Corporation. Buried high sheet resistance structure for high density integrated circuits with reach through contacts. 4,228,450, Cl. 357-51.000.

Anders, Wilfried; and Piepenburg, Werner, to Siemens Aktiengesellschaft. Method for the electrical bonding of thin film tantalum capacitor networks to other networks. 4,227,300, Cl. 29-830.000.

Anderson, David: *See—*
Chapman, John H.; and Anderson, David, 4,227,920, Cl. 75-1.00R.

Anderson, George P., to Electronic Implementation Systems, Inc. Emergency vehicle traffic control system. 4,228,419, Cl. 340-32.000.

Anderson, Ralph: *See—*
Henckels, Lutz; Haas, Rene; and Anderson, Ralph, 4,228,537, Cl. 371-23.000.

Ando, Shigeo; and Kondou, Takayasu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,227,435, Cl. 84-1.190.

Andrew, Eduardo V.; Naunas, Robert A., Jr.; and Armstrong, Richard C., Jr., to Frick Company. Solid state compressor control system. 4,227,862, Cl. 417-12.000.

Angersbach, Wolfgang; and Meier, Karl-Heinz, to Quick-Rotan Becker & Notz KG. Speed-regulated positioning drive. 4,228,385, Cl. 318-614.000.

Angerstein, Joerg, to Siemens Aktiengesellschaft. Method for producing a single transistor storage cell. 4,227,297, Cl. 29-571.000.

Annis, Martin, to American Science and Engineering, Inc. Detector on wheel system (flying spot). 4,228,357, Cl. 250-445.00T.

Annovi, Giuseppe, to Dolomite, S.p.A. Sport footwear of injected plastics material. 4,227,322, Cl. 36-117.000.

Antypas, George A., to Varian Associates, Inc. Prevention of decomposition of phosphorous containing substrates during an epitaxial growth sequence. 4,227,962, Cl. 156-624.000.

Anvil Corporation: *See—*
McElhaney, William G., 4,227,393, Cl. 72-327.000.

Aoki, Eiichiro: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,403, Cl. 328-15.000.

Aoki, Kunitoshi; Honda, Makoto; Dozono, Tetsuro; and Katsumata, Tsutomu, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of acrylonitrile. 4,228,098, Cl. 260-465.300.

Aono, Shunji: *See—*
Yamamoto, Michihiro; Koshiba, Masao; and Aono, Shunji, 4,228,167, Cl. 424-251.000.

Arai, Kiyoyuki, to Copal Company Limited. Blade type focal plane shutter. 4,227,793, Cl. 354-246.000.

Arco Industries Ltd.: *See—*
D'Andrade, Bruce M., 4,227,508, Cl. 124-16.000.

Ardissone, Alberto: *See—*
Colombo, Giancarlo; and Ardissone, Alberto, 4,228,116, Cl. 264-119.000.

Arenz, Bruno, to Losenhausen Maschinenbau AG. Vibratory compacting roller. 4,227,827, Cl. 404-121.000.

Ares, Inc.: *See—*
Gillum, Richard R., 4,227,439, Cl. 89-190.000.

Argus Chemical Corporation: *See—*
Lewis, Roger N.; and Bock, Lawrence A., 4,228,306, Cl. 568-563.000.

Arikawa, Junichi: *See—*
Uchida, Shinya; and Arikawa, Junichi, 4,227,686, Cl. 271-95.000.

Armour Pharmaceutical Company: *See—*
Fisher, Joseph D.; Curry, Willie M.; and Hrinda, Michael E., 4,228,154, Cl. 424-101.000.

Armstrong, Richard C., Jr.: *See—*
Andrew, Eduardo V.; Naunas, Robert A., Jr.; and Armstrong, Richard C., Jr., 4,227,862, Cl. 417-12.000.

Arnold, Dan M.: *See—*
Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., 4,228,350, Cl. 250-267.000.

Arnold, Frank, Jr.; and Geiger, Dana F., to Kollmorgen Technologies Corporation. Brushless DC printed motor. 4,228,384, Cl. 318-254.000.

Arnoldi, Douglas R.; Hurkmans, Antoon M.; and Tolman, Wayne D., to Burroughs Corporation. Document receiver in a document processing machine. 4,227,801, Cl. 355-75.000.

Arrington, Jack P.: *See—*
Wade, Lisby L.; Clarke, Donald L.; and Arrington, Jack P., 4,228,186, Cl. 424-327.000.

Asada, Haruo, to Tokyo Shibaura Denki Kabushiki Kaisha. Pattern identification system. 4,228,421, Cl. 340-146.3MA.

Asahi-Dow Limited: *See—*
Higashizume, Ryuichi; and Iyoku, Masahiko, 4,228,267, Cl. 526-328.500.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aoki, Kunitoshi; Honda, Makoto; Dozono, Tetsuro; and Katsumata, Tsutomu, 4,228,098, Cl. 260-465.300.
Kobayashi, Hiroshi, 4,228,270, Cl. 528-8.000.
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,227,799, Cl. 355-27.000.
Takayanagi, Motowo; and Kajiyama, Tisato, 4,228,218, Cl. 525-58.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Komoto, Shinsuke, 4,227,791, Cl. 354-196.000.

Asai, Mitsuko: *See—*
Higashide, Eiji; Hatano, Kazunori; and Asai, Mitsuko, 4,228,239, Cl. 435-119.000.

Asaki-Dow Limited: *See—*
Izawa, Shinichi; Sugiyama, Jun; and Nakanishi, Atsuo, 4,228,064, Cl. 260-45.70P.

Asano, Kiro; Saito, Tsuyoshi; Hatanaka, Masayoshi; and Ikeda, Susumu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Nitrogen containing polysaccharide and process for preparing same. 4,228,275, Cl. 536-18.000.

Asano, Masaharu: *See—*
Takase, Sadao; Asano, Masaharu; and Manaka, Nobuzi, 4,227,507, Cl. 123-492.000.

ASEA Aktiebolag: *See—*
Stenkvist, Sven-Einar, 4,228,314, Cl. 13-9.00R.

Atchison, George J.; McEwen, Gerald K.; and Stevens, Violete L., to Dow Chemical Company, The. 2,2-Dialkylpropane-1,3-diolbis[bis(acryloyloxyalkyl)phosphates]. 4,228,108, Cl. 260-928.000.

Atlantic Richfield Company: *See—*
Blake, Floyd A.; and Northrup, Lynn L., Jr., 4,227,513, Cl. 126-425.000.
Dearth, James D.; and Smith, Robert H., 4,227,990, Cl. 208-8.00R.

Atlas Copco Aktiebolag: *See—*
Eriksson, Sven E., 4,227,869, Cl. 418-206.000.

Ato Chimie: *See—*
Marie, Gilbert, 4,228,252, Cl. 525-247.000.
Marie, Gilbert, 4,228,253, Cl. 525-247.000.

Atomic Energy of Canada Limited: *See—*
Butler, John P.; Rolston, John H.; den Hartog, James; Molson, Fred W. R.; and Goodale, John W., 4,228,034, Cl. 252-430.000.

Audi NSU Auto Union: *See—*
Steinwart, Johannes; and Bauder, Armin, 4,227,502, Cl. 123-454.000.

Augsburger, Rolf; Kuppka, Horst; and Zilling, Helmut, to Klein, Schanzlin & Becker AG. Valve for controlling the flow of hot fluids. 4,227,545, Cl. 137-340.000.

Austin, Robert A.; and Shackle, Dale R., to Mead Corporation, The. Production of radiation curable microcapsular coating compositions, pressure-sensitive transfer paper and its production. 4,228,216, Cl. 428-307.000.

Austin, Thomas H.: *See—*
Speranza, George P.; Zimmerman, Robert L.; and Austin, Thomas H., 4,228,310, Cl. 568-620.000.

Australian Wire Industries Proprietary Limited: *See—*
Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., 4,228,200, Cl. 427-47.000.

Automobile Parts Manufacturing Company Limited: *See—*
Ishiwata, Hideyuki; and Ishino, Kunihiro, 4,227,599, Cl. 192-54.000.

Automobiles Peugeot: *See—*
Lebault, Jean-Claude; and Rabouille, Guy, 4,227,736, Cl. 296-65.00R.

Avalon, Max; Kowalski, John L.; and Tippetts, K. Boyd, to Honeywell Information Systems Inc. Automation system for mounting film segments into fixtures. 4,227,289, Cl. 29-33.00K.

B. C. Gearworks Ltd.: *See—*
Hrescak, Stan, 4,227,680, Cl. 254-344.000.

B. F. Goodrich Company, The: *See—*
Cohen, Louis, 4,228,130, Cl. 422-131.000.
Doljack, Frank A., 4,228,513, Cl. 364-550.000.
Kim, Heung T., 4,227,870, Cl. 425-208.000.

Babcock & Wilcox Company, The: *See—*
Plavsity, Louis, 4,227,395, Cl. 72-402.000.

Babcock & Wilcox, Limited: *See—*
Hawkins, Ronald J.; and Ruffell, Anthony E., 4,227,551, Cl. 138-40.000.

Baber, David J.: *See—*
Waite, John C.; and Baber, David J., 4,228,503, Cl. 364-200.000.

Bagus, Brian M., to Marmon Company. Electronic musical instrument having multiplexed keying. 4,227,432, Cl. 84-1.010.
Bailey, William L.: *See—*
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,227,298, Cl. 29-837.000.
Bairon, Genrikh V.: *See—*
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A., 4,227,451, Cl. 100-295.000.
Baker, Forrest E.; and Sasaki, George N. Ski locking device. 4,227,707, Cl. 280-814.000.
Baker Protective Services, Incorporated: *See—*
Le Nay, Tom W.; Hadden, Donald L.; and Beckwith, George S., 4,228,424, Cl. 340-506.000.
Balaban, Alvin R.: *See—*
Steckler, Steven A.; and Balaban, Alvin R., 4,228,463, Cl. 358-158.000.
Balinski, Henry A., to United States Gypsum Company. Resilient furring member. 4,227,360, Cl. 52-720.000.
Ballantyne, John R.; and Heden, Axel M., deceased (by Heden, Ingrid V., executrix), to Superscope, Inc. Grille for loudspeaker cabinet. 4,227,590, Cl. 181-175.000.
Banich, John N., Sr.: *See—*
Lecinski, Frank H., Jr.; and Banich, John N., Sr., 4,227,616, Cl. 215-246.000.
Baran, Joseph: *See—*
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,227,720, Cl. 283-8.00R.
Barber, Luther J. Toilet soil pipe flange fastener. 4,227,722, Cl. 285-56.000.
Barclay, Donald J.; Bird, Colin L.; Hallett, Michael H.; and Martin, David H., to International Business Machines Corporation. Electrochromic display device. 4,228,431, Cl. 340-719.000.
Bargainnier, Roger B.: *See—*
Steigelman, James Q.; Bargainnier, Roger B.; Shaffer, Glenn A., deceased; Charland, Irene S., administrator DBN CTA; and Harris, Geoffrey L., 4,228,214, Cl. 428-212.000.
Barker, Charles E., to Robertshaw Controls Company. Self-calibrating electric clock circuit. 4,228,346, Cl. 235-92.00T.
Barkow, William H.: *See—*
Campbell, Francis J.; and Barkow, William H., 4,228,413, Cl. 335-213.000.
Baron, Bruce: *See—*
Nigrelli, Gus; and Baron, Bruce, 4,227,388, Cl. 70-427.000.
Barre, Francoise: *See—*
Dubois, Jean C.; and Barre, Francoise, 4,228,087, Cl. 260-408.000.
Bartels, Willem, to Hazemeijer B.V. Contact device. 4,227,596, Cl. 191-23.00A.
Bartlett, Joel F.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.
Barton, Robert W., to Minnesota Mining and Manufacturing Company. Photohardenable composition. 4,227,978, Cl. 204-159.120.
BASF Aktiengesellschaft: *See—*
Rotter, Gerhard, 4,228,460, Cl. 358-127.000.
BASF Wyandotte Corporation: *See—*
Moore, Richard A.; Hartman, Robert J.; Levis, William W., Jr.; and Bloom, Ralph E., 4,228,247, Cl. 521-107.000.
Narayan, Thirumurti, 4,228,095, Cl. 260-453.0AM.
Bassinger, Grey, to Bassinger, Grey. Roller reamer apparatus. 4,227,586, Cl. 175-346.000.
Bata Shoe Company, Inc.: *See—*
Hurst, Eric J.; and MacAulay, Hugh G., 4,227,556, Cl. 141-137.000.
Batchelder, J. Samuel: *See—*
Zewail, Ahmed H.; and Batchelder, J. Samuel, 4,227,939, Cl. 136-247.000.
Bates, Robert E. Apparatus for simulating a woodgrain finish. 4,227,558, Cl. 144-2.00R.
Bauder, Armin: *See—*
Steinwart, Johannes; and Bauder, Armin, 4,227,502, Cl. 123-454.000.
Bauer, Peter; and Lazrus, Julian, to Bowles Fluidics Corporation. Liquid oscillator having control passages continuously communicating with ambient air. 4,227,550, Cl. 137-835.000.
Baumann, Hanspeter: *See—*
Hohenegger, Helmut; Baumann, Hanspeter; and Buchel, Urs, 4,227,880, Cl. 8-524.000.
Baumann, Heinz, to Sulzer Brothers Limited. Weaving machine having an air duct for cleaning purposes. 4,227,552, Cl. 139-1.00C.
Baur, Rudolf, to Swiss Aluminum Ltd. Lubricant for metal strip. 4,228,217, Cl. 428-409.000.
Bauzhis, Albertas V.; Kornyak, Petr P.; Razhaitis, Vitautas K.; and Shneideris, Ioselis K. Magnetic deflection system. 4,228,414, Cl. 335-213.000.
Baxter Travenol Laboratories, Inc.: *See—*
Alexander, John B.; Dennehey, T. Michael; Greff, Richard J.; and Munsch, John M., 4,227,730, Cl. 294-16.000.
Bodnar, Bert S.; and Schnell, William J., 4,227,295, Cl. 29-527.300.
De Frank, Michael P.; and Scott, James W., 4,227,527, Cl. 128-214.00R.
De Vries, James H.; and Berry, Gaylord L., 4,228,015, Cl. 210-321.00R.
Lamadrid, Rene G., 4,227,420, Cl. 73-756.000.
Soodak, Charles; Lamadrid, Rene G.; and Lohr, David, 4,227,814, Cl. 356-410.000.
Ward, Gary A.; and Winchell, David A., 4,227,954, Cl. 156-250.000.
Bayer Aktiengesellschaft: *See—*
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muler, Erwin; Mazanek, Jan; and Haas, Peter, 4,228,249, Cl. 521-159.000.
Genth, Hermann; Paulus, Wilfried; Schiller, Paul; Sattlegger, Hans; and Schnurrbusch, Karl, 4,228,065, Cl. 260-45.80N.
Grotkopp, Detlef; Wedemeyer, Karlfried; Brandes, Wilhelm; Scheinpflug, Hans; and Roessler, Peter, 4,228,181, Cl. 424-300.000.
Hofer, Wolfgang; and Lurssen, Klaus, 4,227,918, Cl. 71-103.000.
Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,228,178, Cl. 424-274.000.
Lachmann, Burkhard; Rudolph, Hans; and Cohnen, Wolfgang, 4,228,067, Cl. 260-45.85V.
Petersen, Otto; and Schmidt, Hans-Dieter, 4,227,974, Cl. 204-1.00T.
BBC Brown Boveri & Company Limited: *See—*
Fiorentzis, Michael, 4,228,398, Cl. 324-418.000.
Osman, Maged A., 4,228,029, Cl. 252-299.000.
Prochazka, Kamil; and Suter, Franz, 4,227,441, Cl. 91-374.000.
Snedkerud, Ole; and Wild, Peter J., 4,228,541, Cl. 455-158.000.
Beauchamp, Richard L., to Bell Telephone Laboratories, Incorporated. Electrode structure for energy cells. 4,228,228, Cl. 429-194.000.
Becka, Michael M., to International Shoe Machine Corporation. Adhesive applying machine. 4,227,483, Cl. 118-411.000.
Beckenbaugh, William M.; and Morton, Kim L., to Western Electric Company, Inc. Method of depositing a stress-free electroless copper deposit. 4,228,213, Cl. 428-209.000.
Beckman Instruments, Inc.: *See—*
Crosby, John B., 4,228,394, Cl. 324-62.000.
Hoffa, Jack L., 4,227,815, Cl. 356-436.000.
Momany, Frank A., 4,228,155, Cl. 424-177.000.
Momany, Frank A., 4,228,156, Cl. 424-177.000.
Momany, Frank A., 4,228,157, Cl. 424-177.000.
Momany, Frank A., 4,228,158, Cl. 424-177.000.
Beckwith, George S.: *See—*
Le Nay, Tom W.; Hadden, Donald L.; and Beckwith, George S., 4,228,424, Cl. 340-506.000.
Becton, Dickinson and Company: *See—*
Conway, Hugh T., 4,227,620, Cl. 215-355.000.
Beduchaud, Michel: *See—*
de Loye, Martin; and Beduchaud, Michel, 4,228,467, Cl. 358-261.000.
Beecham Group Limited: *See—*
Brewer, Malcolm D.; and Griffin, Gerald J. L., 4,228,149, Cl. 424-14.000.
Ponsford, Roger J.; and Howarth, Thomas T., 4,228,174, Cl. 424-272.000.
Beermann, Heinrich; and Lambrecht, Dietrich, to Kraftwerk Union Aktiengesellschaft. Device for bracing an air-gap winding. 4,228,375, Cl. 310-214.000.
Beezer, Earl F., to Stelron Cam Company. Device for picking up and placing articles on movable conveyors and assembly lines and to an endless conveyor construction and to an article pickup and deposit device therefor. 4,227,851, Cl. 414-626.000.
Beezley, Dale L.; and Goodman, Wolf, to United States of America, Navy. Dual output simultaneous firing circuit. 4,227,461, Cl. 102-218.000.
Behney, Charles A. Method and apparatus for altering an equine leg conformation. 4,227,311, Cl. 33-195.000.
Belangee, Kenneth, to Olin Corporation. Process for making tube in sheet heat exchangers. 4,227,391, Cl. 72-54.000.
Belcher, Richard A., to Gould Inc. Electric fuse and method of manufacturing the same. 4,228,417, Cl. 337-252.000.
Bell Telephone Laboratories, Incorporated: *See—*
Beauchamp, Richard L., 4,228,228, Cl. 429-194.000.
Bobeck, Andrew H., 4,228,523, Cl. 365-19.000.
Celli, John R.; and Nash, Donald H., 4,228,320, Cl. 179-2.0EA.
Cenker, Ronald P.; and Procyk, Frank J., 4,228,528, Cl. 365-200.000.
Christian, Paul A.; Di Salvo, Francis J., Jr.; and Murphy, Donald W., 4,228,226, Cl. 429-194.000.
Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., 4,228,323, Cl. 179-16.00F.
Flanagan, James L., 4,228,321, Cl. 179-1.50S.
Hartman, Robert L.; Koszi, Louis A.; Mogab, Cyril J.; and Schwartz, Bertram, 4,227,975, Cl. 204-15.000.
Vazirani, Hargovind N., 4,228,438, Cl. 346-1.100.
Weiss, Roger E., 4,228,514, Cl. 364-551.000.
Beloit Corporation: *See—*
Justus, Edgar J., 4,227,658, Cl. 242-66.000.
Bendall, Wilfrid H. Single rocker joint drive chain. 4,227,425, Cl. 474-213.000.
Bendix Corporation, The: *See—*
Goodrich, George W., 4,227,775, Cl. 350-267.000.
Haase, Elmer A., 4,227,492, Cl. 123-59.00B.
Kluger, Michael A., 4,227,594, Cl. 188-361.000.
Benjamin, Joseph R., to Wirth Maschinen-und Bohrgerate-Fabrik. Method and apparatus for sinking shafts. 4,227,583, Cl. 175-65.000.
Bennett, Gregory B., to Sandoz, Inc. Pyrano[4,3-e]-as-triazines and corresponding 4-oxides. 4,228,280, Cl. 544-184.000.

Bennett, Richard N., to National Instrument Company, Inc. Trimmer arrangement for filling unit of automatic filling machine. 4,227,627, Cl. 222-282.000.

Bennstedt, Leif-Ake: *See*—
Loqvist, Kaj-Ragnar; and Bennstedt, Leif-Ake, 4,227,986, Cl. 204-209.000.

Benson, Richard E.: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; Week, Robert D.; Benson, Richard E.; VandeWiele, John L.; and Lucas, James R., 4,227,363, Cl. 56-10.200.

Benthaus, Friedrich, to Bergwerksverband GmbH. Automatic longwall mining system and method. 4,228,508, Cl. 364-420.000.

Benwood, Bruce R.; and LaChapelle, Paul A., to Eastman Kodak Company. Electrophotographic apparatus with improved corona charging. 4,228,480, Cl. 361-235.000.

Berendsohn AG: *See*—
Kitzerow, Ernst R., 4,227,823, Cl. 401-99.000.

Bergeson, Richard P., to Maytag Company, The. Dishwasher fluid control system. 4,227,546, Cl. 137-387.000.

Bergey, Taylor G. Mud level monitor. 4,228,530, Cl. 367-112.000.

Bergvall, Bengt A., to Husqvarna AB. Sewing machine with electronic pattern data circuits. 4,227,472, Cl. 112-158.00E.

Bergwerksverband GmbH: *See*—
Benthaus, Friedrich, 4,228,508, Cl. 364-420.000.

Berman, Arnold: *See*—
Wachs, Marvin R.; and Berman, Arnold, 4,228,401, Cl. 325-3.000.

Bernaerts, Henry J. Anti-sway device for hoists and cranes. 4,227,677, Cl. 254-264.000.

Bernhard, Theodore L.; Dummermuth, Ernst; Hoch, Thomas M.; Jaffe, Bruce S.; and Merrell, Gregory L., to Allen-Bradley Company. Multiprocessor numerical control system. 4,228,495, Cl. 364-101.000.

Berry, Gaylord L.: *See*—
De Vries, James H.; and Berry, Gaylord L., 4,228,015, Cl. 210-321.00R.

Berry, Robert W., to Fansteel Inc. Grooving and cut-off tool. 4,227,838, Cl. 407-77.000.

Bertsch, Richard: *See*—
Schnurle, Hans; and Bertsch, Richard, 4,227,491, Cl. 123-488.000.

Bertus, Brent J.; and Walker, Darrell W., to Phillips Petroleum Company. Lithium- or magnesium-promoted zinc titanate catalyst for dehydrogenation of hydrocarbons. 4,228,040, Cl. 252-475.000.

Besecke, Siegmund; Gaenzler, Wolfgang; and Schroeder, Guenter, to Rohm GmbH. Preparation of carboxylic acid amides. 4,228,102, Cl. 260-561.00N.

Better Built Machinery Corporation: *See*—
Wolff, Robert, 4,228,135, Cl. 422-296.000.

Better Wire Products, Inc.: *See*—
Ortel, Stanley G., 4,227,642, Cl. 229-52.0AW.

Bezwada, Rao S., to American Cyanamid Company. Method of adhesion of rubber to reinforcing materials. 4,228,045, Cl. 260-4.00R.

Bhushan, Bharat, to Mechanical Technology Incorporated. High temperature low friction surface coating. 4,227,756, Cl. 308-241.000.

Biancardi, Michael J. Automatic vehicle starting apparatus. 4,227,588, Cl. 180-167.000.

Bicskei, Bela J. Precision blocking of lens blank. 4,227,349, Cl. 51-284.00E.

Bifok AB: *See*—
Ruzicka, Jaromir; and Hansen, Elo H., 4,227,973, Cl. 204-1.00T.

Bingler, Douglas J., to Milton Roy Company. Flowmeter. 4,227,409, Cl. 73-861.710.

Bio-Tronics, Inc.: *See*—
Connor, Gerald I., 4,227,535, Cl. 128-401.000.

Biphase Energy Systems, Inc.: *See*—
Amend, William E.; and Studhalter, Walter R., 4,227,373, Cl. 60-618.000.

Bird, Colin L.: *See*—
Barclay, Donald J.; Bird, Colin L.; Hallett, Michael H.; and Martin, David H., 4,228,431, Cl. 340-719.000.

Birkmeyer, William J.: *See*—
Lewarchik, Ronald J.; Erikson, J. Alden; and Birkmeyer, William J., 4,228,294, Cl. 548-312.000.

Bischof, Rudolf; Rhyner, Heinz; and Saxer, Kurt, to Metallwerk AG Buchs. Method and apparatus for fractional crystallization separation. 4,228,089, Cl. 260-428.500.

Bissar, Saadi; and George, Douglas, to Timex Corporation. Hermetic seal for electrochromic display. 4,227,779, Cl. 350-357.000.

Bitou, Minoru: *See*—
Kobayashi, Nobuyuki; Suematsu, Toshio; and Bitou, Minoru, 4,227,490, Cl. 123-492.000.

Bixler, Richard M.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.

Black Body Corporation: *See*—
Stricker, Jesse C.; and Wagner, Dennis L., 4,228,345, Cl. 219-388.000.

Black, Herbert L.; Somerville, Mark; and Schwertz, Jerome, to Cyclops Corporation, Universal-Cyclops Specialty Steel Division. Powder metallurgy. 4,227,927, Cl. 75-225.000.

Black Knight Investments, Limited: *See*—
Tureaud, Kenneth E.; Ginsburg, Stephen; and Draheim, Frederick, 4,227,877, Cl. 433-37.000.

Black, William B.: *See*—
Wu, Wen-Li; and Black, William B., 4,228,118, Cl. 264-210.800.

Blaha, James G., to Towmotor Corporation. Seal. 4,227,704, Cl. 277-84.000.

Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muler, Erwin; Mazanek, Jan; and Haas, Peter, to Bayer Aktiengesellschaft. Segmented polyurethane resins. 4,228,249, Cl. 521-159.000.

Blake, David W.; Delgado, Alberto W.; and Sheehan, Gerard M., to American Cyanamid Company. High dry hide TiO_2 slurries. 4,227,935, Cl. 106-308.00B.

Blake, Floyd A.; and Northrup, Lynn L., Jr., to Atlantic Richfield Company. Solar system having improved heliostat and sensor mountings. 4,227,513, Cl. 126-425.000.

Blattermann, Karl-Gunther: *See*—
Gerdes, Heinz; and Blattermann, Karl-Gunther, 4,227,610, Cl. 198-831.000.

Bliss, William E., to Dermik Laboratories. Method for treating pseudofolliculitis barbae. 4,228,163, Cl. 424-240.000.

Blodgett, Raymond W.: *See*—
Blodgett, Raymond W., Jr.; and Blodgett, Raymond W., 4,227,713, Cl. 280-434.000.

Blodgett, Raymond W., Jr.; and Blodgett, Raymond W. Trailer hitch latching assembly. 4,227,713, Cl. 280-434.000.

Blomberg, Knut H. Telephone set. 4,228,325, Cl. 179-100.00R.

Bloom, Ralph E.: *See*—
Moore, Richard A.; Hartman, Robert J.; Levis, William W., Jr.; and Bloom, Ralph E., 4,228,247, Cl. 521-107.000.

Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., to Polaroid Corporation. Novel sulfam(na)phthaleins. 4,228,075, Cl. 260-243.300.

Bluhm, Karl H.; and Kunath, Helfrid, to U.S. Philips Corporation. Device for crushing calculi in the urinary bladder. 4,227,532, Cl. 128-328.000.

Blum, Alvin S. Urine specimen collector. 4,227,413, Cl. 73-421.00R.

Blumenberg, Gunther, to Kabel- und Metallwerke Gutehoffnungshutte AG. Method of making a gas-tight joint between a corrugated high quality steel tube and a high quality steel sleeve. 4,227,639, Cl. 228-173.00F.

Bobbe, Richard M.; Durbin, John A.; Lehman, Richard F.; and Seedhouse, Frederick A., to Xerox Corporation. Half-tone imaging system. 4,227,795, Cl. 355-3.00R.

Bobeck, Andrew H., to Bell Telephone Laboratories, Incorporated. Conductor access bubble memory arrangement. 4,228,523, Cl. 365-19.000.

Bock, Georg: *See*—
Massengeil, Hans A.; Bock, Georg; and Steinlehner, Fritz, 4,227,803, Cl. 355-50.000.

Bock, Lawrence A.: *See*—
Lewis, Roger N.; and Bock, Lawrence A., 4,228,306, Cl. 568-563.000.

Bodmann, Erik, to Siempelkamp Giesserei GmbH. Pressure vessel assembly for high-temperature nuclear reactor. 4,227,968, Cl. 176-87.000.

Bodnar, Bert S.; and Schnell, William J., to Baxter Travenol Laboratories, Inc. Method of potting the ends of a bundle of hollow fibers positioned in a casing. 4,227,295, Cl. 29-527.300.

Boeing Company, The: *See*—
Johnson, Walter J.; and Selis, James J., 4,228,510, Cl. 364-521.000.
Pond, Charles R.; and Texeira, Patrick D., 4,227,807, Cl. 356-152.000.

Bogan, Richard T.: *See*—
Kuo, Chung-Ming; and Bogan, Richard T., 4,228,276, Cl. 536-76.000.

Bogatzki, Hans U. Apparatus for spacing articles moving in a line. 4,227,606, Cl. 198-459.000.

Boger, Manfred; Drabek, Josef; Mattern, Gunter; and Traber, Water, to Ciba-Geigy Corporation. Bis-(phenoxyalkyl-2-imidazolin)-1,1-sulfides, process for their manufacture, compositions which contain these sulfides as active component and use thereof in pest control. 4,228,175, Cl. 424-273.00R.

Bogert, Bruce P.; and Hirsch, Peter, to United States of America, Navy. Automatic underwater null steering. 4,228,531, Cl. 367-135.000.

Bohner, Beat: *See*—
Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, 4,227,914, Cl. 71-88.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,227,365, Cl. 56-13.600.
van der Lely, Ary; and Bom, Cornelis J. G., 4,227,580, Cl. 172-112.000.

Bon Aqua, Inc.: *See*—
Zimmerman, George M., 4,228,010, Cl. 210-222.000.

Bondinell, William E.; and Pendleton, Robert G., to SmithKline Corporation. 7- and/or 8-Sulfur substituted 1,2,3,4-tetrahydroisoquinoline compounds. 4,228,170, Cl. 424-258.000.

Bonfilio, Paul. Collapsible shelter. 4,227,542, Cl. 135-4.00R.

Bonner, John J.; and Clayton, C. William, to Fischer & Porter Company. Capacitive pressure transducer. 4,227,418, Cl. 73-706.000.

Boon, Bruce T. E., to Eastern Cyclone Industries, Inc. Air scrubber apparatus. 4,227,895, Cl. 55-226.000.

Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., to Carborundum Company, The. Method for providing electrical connection. 4,228,344, Cl. 219-270.000.

Borden, Inc.: *See*—
Williams, Alexander W.; and Kline, Harry A., 4,227,981, Cl. 204-180.00P.

Borg-Warner Corporation: *See—*
Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, 4,228,312, Cl. 585-250.000.
Borgeas, Alexander T. Cushioned sole for footwear. 4,227,320, Cl. 36-88.000.
Borror, Alan L.: *See—*
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,228,075, Cl. 260-243.300.
Borst, William A.: *See—*
Talansky, Alan R.; Respess, Herman M.; and Borst, William A., 4,227,308, Cl. 33-169.00B.
Bossetti, Renato, to Societa Impianti Termoelettrici Industriali (s.a.s.). Apparatus for loading ovens for the production of tiles. 4,227,847, Cl. 414-152.000.
Botnick, Irlin H. Multiple control valve for mixing fluids. 4,227,548, Cl. 137-606.000.
Bouchard, Robert J.; Brixner, Lothar H.; and Popowich, Michael J., to Du Pont de Nemours, E. I., and Company. Multilayer ceramic capacitors. 4,228,482, Cl. 361-321.000.
Bourassa, Joseph R.; and Lopez, Manuel, to Parker-Hannifin Corporation. Vehicle rear view mirror mounting. 4,227,671, Cl. 248-480.000.
Bouvier, Julien J. Motorcycle safety device. 4,227,717, Cl. 280-753.000.
Bowers, William, Jr.; and Grooms, William L., Jr. Spanner socket wrench. 4,227,429, Cl. 81-90.00C.
Bowles Fluidics Corporation: *See—*
Bauer, Peter; and Lazrus, Julian, 4,227,550, Cl. 137-835.000.
Bowley, Thomas W.: *See—*
Clewes, Antony B.; and Bowley, Thomas W., 4,227,768, Cl. 339-198.00H.
Boyd, Gary L.: *See—*
Knapp, Charles A.; and Boyd, Gary L., 4,227,568, Cl. 165-8.000.
Bozler, Carl O.; Chapman, Ralph L.; Fan, John C. C.; and McClelland, Robert W., to Massachusetts Institute of Technology. Shallow-homojunction solar cells. 4,227,941, Cl. 136-255.000.
Bozzelli, John W.; and Morris, Nancy J., to Dow Chemical Company, The. Method of preparing quaternary ammonium salts from various morpholinones. 4,228,096, Cl. 260-459.00A.
Braatz, Paul O., to Hughes Aircraft Company. Semiconductor diode array liquid crystal device. 4,228,449, Cl. 357-30.000.
Bradley Enterprises, Inc.: *See—*
Miller, Clarence J., 4,227,361, Cl. 52-742.000.
Brandes, Wilhelm: *See—*
Grotkopp, Detlef; Wedemeyer, Karlfried; Brandes, Wilhelm; Scheinpflug, Hans; and Roessler, Peter, 4,228,181, Cl. 424-300.000.
Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,228,178, Cl. 424-274.000.
Bratschi, K.: *See—*
Bratschi, Konrad, 4,227,564, Cl. 160-345.000.
Bratschi, Konrad, to Bratschi, K.; and Gliss, Silent. Curtain track with traverse cord. 4,227,564, Cl. 160-345.000.
Breeze Corporations, Inc.: *See—*
Laky, Elmer, 4,227,678, Cl. 254-391.000.
Breidenstein, Charles J.: *See—*
Gueldenpfennig, Klaus; and Breidenstein, Charles J., 4,228,536, Cl. 370-66.000.
Brennan, Ward T.: *See—*
MacMunn, George D.; and Brennan, Ward T., 4,227,666, Cl. 246-187.00C.
Bret, Gerard M. M.: *See—*
Henson, Alec F.; and Bret, Gerard M. M., 4,228,189, Cl. 426-40.000.
Brewer, Malcolm D.; and Griffin, Gerald J. L., to Beecham Group Limited. Sustained release compositions. 4,228,149, Cl. 424-14.000.
Bricmont, Robert J.; Hamilton, Philip A.; and Ting, Raymond M. L., to H. H. Robertson Company. Kinetic energy absorbing pad. 4,227,593, Cl. 188-1.00C.
Bridgestone Tire Company, Limited: *See—*
Honda, Toshio; Fukuura, Yukio; Tanuma, Itsuo; Ishikawa, Hikaru; Ogawa, Masao; Kojima, Shozo; and Ueno, Kazunori, 4,227,956, Cl. 156-334.000.
Bringol, Charles R.; and Snyder, Gary F., to International Business Machines Corporation. Decreasing time duration of recorded speech. 4,228,322, Cl. 179-15.55T.
Brinkman, Willem, to Holec N.V. Device for supplying fuel to a combustion engine. 4,227,499, Cl. 123-499.000.
Bristol-Myers Company: *See—*
Godfrey, John C., 4,227,533, Cl. 128-349.0BV.
Montzka, Thomas A.; Matiskella, John D.; and Partyka, Richard A., 4,228,285, Cl. 546-63.000.
Brixner, Lothar H.: *See—*
Bouchard, Robert J.; Brixner, Lothar H.; and Popowich, Michael J., 4,228,482, Cl. 361-321.000.
Brocklehurst, Charles E., to Opelika Manufacturing Corp. Sheet folder. 4,227,684, Cl. 270-67.000.
Broderna Holmbergs Fabriks AB: *See—*
Holmberg, Gote E. Y., 4,227,286, Cl. 24-68.0CD.
Bromley, James E.; McNamara, Michael M.; and Mowe, Wayne T., to Monsanto Company. Process for nylon 66 yarn having a soft hand. 4,228,120, Cl. 264-235.600.
Bronnec, Jean A. L., to Etablissements Generaux de Mecanique de l'Ouest EGMO (Societe Anonyme). Machine for manufacturing pancakes or similar products. 4,227,447, Cl. 99-423.000.
Brooker, Dennis B., to Brooker Folding Knives, Inc. Folding knife. 4,227,303, Cl. 30-154.000.
Brooker Folding Knives, Inc.: *See—*
Brooker, Dennis B., 4,227,303, Cl. 30-154.000.
Brown, Abner D., to Chatham Manufacturing Company. Sonic or ultrasonic apparatus for simultaneously cutting and seaming sheet material. 4,227,959, Cl. 156-515.000.
Brown, Boveri & Cie AG: *See—*
Abraham, Ludwig; and Moschetti, Armando, 4,228,491, Cl. 363-41.000.
Hausler, Michael; and Kanngiesser, Karl W., 4,228,492, Cl. 363-48.000.
Brown, Dale M.; Chow, Tat-Sing P.; Gibbons, James F.; and McConnelee, Paul A., to General Electric Company. Methods of making composite conductive structures in integrated circuits. 4,227,944, Cl. 148-6.000.
Brown, Dale M.; and Garfinkel, Marvin, to General Electric Company. Composite conductive structures in integrated circuits. 4,228,212, Cl. 428-209.000.
Brown, Paul M. Jr., to Precision Monolithics, Inc. High speed integrated switching circuit for analog signals. 4,228,367, Cl. 307-251.000.
Brown, W. Sumner, to Exxon Research & Engineering Co. Variable reluctance stepper motor drive and method of operation as a DC brushless motor. 4,228,387, Cl. 318-696.000.
Brown & Williamson Tobacco Corporation: *See—*
Pile, James E., 4,228,393, Cl. 324-61.00R.
Bruckenstein, Stanley; and Martinchek, Gregory A., to Research Corporation. Conductometric gas analysis cell. 4,228,400, Cl. 324-450.000.
Bruning, Rolf; and Roth, Jurgen, to Heraeus Quarzschmelze GmbH. Cleaning attachment to clean flask-shaped receivers of chemical analysis apparatus. 4,228,129, Cl. 422-102.000.
Brusilovsky, Mikhail G.: *See—*
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.
Brust, David P.: *See—*
Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., 4,228,257, Cl. 525-328.000.
Bryant, David R., to Union Carbide Corporation. Ethylene glycol extraction process. 4,228,094, Cl. 260-450.000.
Buchel, Urs: *See—*
Hohenegger, Helmut; Baumann, Hanspeter; and Buchel, Urs, 4,227,880, Cl. 8-524.000.
Buchmuller, Horst; and Michelbrink, Bernhard, to Deutsche Babcock Aktiengesellschaft. Immersion piece for the ash funnel of a combustion chamber. 4,227,468, Cl. 110-165.00R.
Buck Chemisch-Technische Werke GmbH & Co.: *See—*
Krone, Hartmut; van Acken, Rudiger; Trede, Wolfgang; and Schmidlin, Robert, 4,227,460, Cl. 102-66.000.
Bugaut, Andree: *See—*
Kalopissis, Gregoire; Zysmann, Alexandre; Sebag, Henri; Vanlerberghe, Guy; Huron, Jean-Louis; and Bugaut, Andree, 4,228,259, Cl. 525-435.000.
Bugianesi, Robert L.: *See—*
Ponpipom, Mitree M.; Bugianesi, Robert L.; Durette, Philippe L.; Katzen, Howard M.; and Shen, Tsung-Ying, 4,228,274, Cl. 536-4.000.
Buhler, Rudolf: *See—*
Girard, Henry; and Buhler, Rudolf, 4,228,242, Cl. 435-284.000.
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, to National Research Development Corporation. Testing a cuvette for cleanliness. 4,227,886, Cl. 23-230.00R.
Bunce, Roger A.: *See—*
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.
Bunker Ramo Corporation: *See—*
Fiske, Earl D., 4,227,764, Cl. 339-121.000.
Kuehling, Guenter, 4,227,299, Cl. 29-751.000.
Burch, Anita: *See—*
Spector, Donald; and Burch, Anita, 4,227,264, Cl. 2-84.000.
Burge, Malcolm L. E.; and Nechutny, Zdenek L. A. Z., to Tate & Lyle Limited. Sweetening compositions containing arabinogalactan. 4,228,198, Cl. 426-548.000.
Burger, Manfred; Dukek, Waldeman; Gagel, Ernst; Pretchtl, Alfred; and Kalmovicz, Rudolf. Process and heat pump for the transfer of heat and cold. 4,227,905, Cl. 62-113.000.
Burke, Inc.: *See—*
Johnston, Bruce L., 4,227,269, Cl. 5-66.000.
Burkholder, Wendell: *See—*
Levinson, Hermann; Levinson, Anna-Rose; Burkholder, Wendell; Silverstein, Robert M.; and Cassidy, Robert, 4,227,333, Cl. 43-107.000.
Burov, Pencho V.; and Kyuleva, Nadejda A., to DSO "Pharmachim". Cosmetic composition. 4,228,153, Cl. 424-95.000.
Burr Brown Research Corp.: *See—*
Lalumia, Thomas M.; and Fordemwalt, James N., 4,228,448, Cl. 357-46.000.
Burroughs Corporation: *See—*
Arnoldi, Douglas R.; Hurkmans, Antoon M.; and Tolman, Wayne D., 4,227,801, Cl. 355-75.000.

Gupta, Ram K.; and Vora, Chandrakant R., 4,228,497, Cl. 364-200.000.
Lin, An-Chung R., 4,227,930, Cl. 106-19.000.
Lin, An-Chung R., 4,228,028, Cl. 252-188.30R.
McElligott, Michael J.; and Tkalenko, Victor J., Jr., 4,227,719, Cl. 283-8.00R.
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,227,720, Cl. 283-8.00R.
Schwartz, Sidney J., 4,228,521, Cl. 365-4.000.

Butler Greenwich Inc.: *See*—
Kapoor, Vinod, 4,227,458, Cl. 101-350.000.

Butler, John P.; Rolston, John H.; den Hartog, James; Molson, Fred W. R.; and Goodale, John W., to Atomic Energy of Canada Limited. Catalytically active mass for the exchange of hydrogen isotopes between streams of gaseous hydrogen and liquid water. 4,228,034, Cl. 252-430.000.

Butler, L. Dennis: *See*—
Colby, Richard A.; Parolini, Leo B.; and Butler, L. Dennis, 4,227,845, Cl. 414-39.000.

Buxbaum, Lothar: *See*—
Kainmuller, Thomas; Habermeier, Jurgen; and Buxbaum, Lothar, 4,228,281, Cl. 544-198.000.

C. van der Lely N. V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,227,365, Cl. 56-13.600.
van der Lely, Ary; and Bom, Cornelis J. G., 4,227,580, Cl. 172-112.000.

Cabelli, Gabriel: *See*—
Rahamin, Raphael; and Cabelli, Gabriel, 4,228,470, Cl. 360-12.000.

Cairns, Hugh; and Ingall, Anthony H., to Fisons Limited. Thiopyranobenzopyrans, compositions and method of use thereof. 4,228,173, Cl. 424-269.000.

Cairns, Thomas M.; Dewar, John H.; and Sumner, Emmons F., to Ford Motor Company. Fuse holder with entry control. 4,227,761, Cl. 339-66.00M.

Calbiochem-Behring Corp.: *See*—
Hevey, Richard C.; and Malmros, Mark K., 4,228,237, Cl. 435-7.000.

Calcimatic International Limited: *See*—
Hall, Hubert L., deceased, 4,227,875, Cl. 432-239.000.

Calderon, Reynaldo, to Texaco Inc. Method for cleaning a helical spring sand screen. 4,227,576, Cl. 166-312.000.

Caldwell, Robert A., to Allis-Chalmers Corporation. Method of electroslag welding. 4,228,337, Cl. 219-73.100.

Caldwell, Robert A., to Allis-Chalmers Corporation. Electroslag weld deposit. 4,228,342, Cl. 219-137.0WM.

California Institute of Technology: *See*—
Gray, Harry B.; and Frazier, Claude C., 4,228,035, Cl. 252-431.00R.
Zewail, Ahmed H.; and Batchelder, J. Samuel, 4,227,939, Cl. 136-247.000.

California Polytechnic State University Foundation, The: *See*—
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,228,182, Cl. 424-300.000.

Call, Tracey G.: *See*—
Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., 4,228,182, Cl. 424-300.000.

Calton, Gary J., to W. R. Grace & Co. Dialkoxy monorden derivatives. 4,228,079, Cl. 260-343.410.

Cam Gears Limited: *See*—
Adams, Frederick J., 4,227,549, Cl. 137-625.690.

Cambre, Cushman M., to Procter & Gamble Company, The. Laundry detergent compositions having enhanced particulate soil removal and antiredeposition performance. 4,228,044, Cl. 252-547.000.

Cambridge Filter Corp.: *See*—
Wasielewski, Stanley J.; and Hladik, Stephen M., 4,227,953, Cl. 156-227.000.

Cameron Iron Works, Inc.: *See*—
Williams, Leonard E., Jr., 4,227,543, Cl. 137-246.220.

Cameron, Russell J., to Ross Operating Valve Company. Valve safety indicating means. 4,227,547, Cl. 137-554.000.

Campbell, Francis J.; and Barkow, William H., to RCA Corporation. Saddle-toroid deflection winding for low loss and/or reduced conductor length. 4,228,413, Cl. 335-213.000.

Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., to Eastman Kodak Company. Polymers for use in image receiving elements for metallizable dyes in image transfer film units. 4,228,257, Cl. 525-328.000.

Canadian Patents & Development Ltd.: *See*—
Lord, Ronald D., 4,227,520, Cl. 128-201.240.

Cannon, Thomas M.: *See*—
Fenimore, Edward E.; and Cannon, Thomas M., 4,228,420, Cl. 340-146.30F.

Canon Kabushiki Kaisha: *See*—
Aizawa, Hiroshi; Shimizu, Masami; Uchidoi, Masanori; Tsunekawa, Tokuichi; Iura, Yukio; and Yamamichi, Masayoshi, 4,227,787, Cl. 354-51.000.
Ohta, Shinichi; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,227,780, Cl. 351-7.000.
Shimizu, Masami; and Aizawa, Hiroshi, 4,227,788, Cl. 354-60.00R.
Tsunoi, Haruo, 4,227,797, Cl. 355-10.000.

Canterbury, Bradford: *See*—
Goodwin, Bertram R.; and Canterbury, Bradford, 4,227,673, Cl. 249-117.000.

Caporini, John I.: *See*—
Morton, William A.; and Caporini, John I., 4,227,776, Cl. 350-285.000.

Carborundum Company, The: *See*—
Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., 4,228,344, Cl. 219-270.000.

Cardenas, Carlos G.; and Din, Zia U., to SCM Corporation. Coupling reaction involving a Grignard and allylic halide. 4,228,313, Cl. 585-640.000.

Cariou, Jean: *See*—
Larigaldie, Serge; and Cariou, Jean, 4,228,479, Cl. 361-218.000.

Carlson, Floyd W.; Hester, Michael L.; and Popelka, David A., to Textron, Inc. Fixed leading edge slat spoiler for a horizontal stabilizer. 4,227,665, Cl. 244-210.000.

Carlson, Lee G., to American Petro Mart, Inc. Folded moving bed ion exchange apparatus and method. 4,228,001, Cl. 210-676.000.

Carman, Vincent E., to Vehicle Energy Corporation. Automotive drive system. 4,227,587, Cl. 180-165.000.

Carney, Robert L.; and Henrick, Clive A., to Zoecon Corporation. (11Z,13Z)-11,13-Hexadecadiyn-1-ol and (11Z,13Z)-11,13-hexadecadien-1-ol and trimethylsilyl ethers thereof. 4,228,093, Cl. 556-482.000.

Carr, Norman L.; and Schmid, Bruce K., to Gulf Oil Corporation. Coal liquefaction process with a plurality of feed coals. 4,227,991, Cl. 208-8.0LE.

Carras, Peter A., to Jane C. Terry. Motor mount bracket for twin-hull sail boats. 4,227,480, Cl. 440-63.000.

Carrier Corporation: *See*—
Reedy, Wayne R.; and Russ, Edward F., 4,227,721, Cl. 285-18.000.

Carris, Milton C., to Syntex Puerto Rico, Inc. Inhalation device. 4,227,522, Cl. 128-203.150.

Cascade Corporation: *See*—
Farmer, Stanley E.; and Weinert, Harry F., 4,227,850, Cl. 414-620.000.

Cassidy, Robert: *See*—
Levinson, Hermann; Levinson, Anna-Rose; Burkholder, Wendell; Silverstein, Robert M.; and Cassidy, Robert, 4,227,333, Cl. 43-107.000.

Castanis, George. Word game apparatus. 4,227,697, Cl. 273-272.000.

Castelli, Bertrand. Dual game ball paddle. 4,227,692, Cl. 273-67.00R.

Castle, Alfred B. Tool for lifting and maneuvering utility access covers. 4,227,731, Cl. 294-17.000.

Caterpillar Tractor Co.: *See*—
Crews, Donald R., 4,227,570, Cl. 165-67.000.
Livesay, Richard E., 4,227,744, Cl. 299-94.000.
Meisel, Thomas C., Jr., 4,227,748, Cl. 305-10.000.

Caunt, Anthony D.; and Williams, Ian G., to Imperial Chemical Industries Limited. Process for the production of polymer or copolymer of an olefin monomer. 4,228,262, Cl. 526-119.000.

CBS Inc.: *See*—
Meshulam, Avram, 4,227,306, Cl. 30-342.000.

Celanese Corporation: *See*—
Levine, Nathan M.; and Von Drathen, Walter, 4,227,996, Cl. 209-12.000.

Celli, John R.; and Nash, Donald H., to Bell Telephone Laboratories, Incorporated. Noise detector for frequency modulation systems. 4,228,320, Cl. 179-2.0EA.

Celto, John E.: *See*—
Schimitschek, Erhard J.; and Celto, John E., 4,228,408, Cl. 331-94.50G.

Cenker. Ronald P.; and Procyk, Frank J., to Bell Telephone Laboratories, Incorporated. Memory with redundant rows and columns. 4,228,528, Cl. 365-200.000.

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Pirlet, Robert A., 4,227,812, Cl. 356-372.000.
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Centre Electronique Horloger S.A.: *See*—
Fellrath, Jean; and Perotto, Jean-Felix, 4,228,534, Cl. 368-224.000.
Gerber, Bernard; and Leuenberger, Fritz, 4,228,527, Cl. 365-185.000.

Century Geophysical Corporation: *See*—
West, Jerry B., 4,227,404, Cl. 73-151.000.
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Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,228,326, Cl. 179-100.10G.

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Hudecek, Slavko; Hnidek, Jaroslav; Heidingsfeld, Viktor; Kolarik, Jan; and Zelinger, Jiri, 4,228,205, Cl. 428-35.000.
Stoy, Artur, 4,228,056, Cl. 260-29.6AN.

Cha, Chang Y., to Occidental Oil Shale, Inc. Locating the top of an in situ oil shale retort for ease of ignition. 4,227,574, Cl. 166-259.000.

Chalabian, Jack S., to K-Jack Engineering Company, Inc. Coin selecting funnel. 4,227,604, Cl. 194-102.000.

Chamberlin, George P., to Motorola, Inc. Microprocessor having multiply/divide circuitry. 4,228,518, Cl. 364-759.000.

Champion International Corporation: *See*—
Roccaforte, Harry L., 4,227,640, Cl. 229-41.00C.

Chang, Augustine W.: *See*—
Anantha, Narasipur G.; and Chang, Augustine W., 4,228,450, Cl. 357-51.000.

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Chapman, John H.; and Anderson, David, to Yara Engineering Corporation. Methods of clay benefication. 4,227,920, Cl. 75-1.00R.

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Bozler, Carl O.; Chapman, Ralph L.; Fan, John C. C.; and McClelland, Robert W., 4,227,941, Cl. 136-255.000.

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Chatham Manufacturing Company: *See—*
Brown, Abner D., 4,227,959, Cl. 156-515.000.

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Tasch, Al F., Jr.; and Chatterjee, Pallab K., 4,228,445, Cl. 357-24.000.

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Chemap AG: *See—*
Girard, Henry; and Buhler, Rudolf, 4,228,242, Cl. 435-284.000.

Chemed Corporation: *See—*
Tesdahl, Thomas C., 4,228,048, Cl. 260-17.4UC.

Chemische Fabrik Dr. Wiedeking: *See—*
Ohm, Klaus, 4,228,059, Cl. 260-30.200.

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Rigler, Josef K.; Leithauser, Horst; Trukenbrod, Karl; and Ogrzewalla, Werner, 4,228,244, Cl. 521-56.000.

Chen, Sow-Mei L.; and Grudzinskas, Charles V., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-fluoromethyl, difluoromethyl or trifluoromethyl prostaglandins of the E and F series. 4,228,298, Cl. 560-121.000.

Cheng, Paul J.; and Mills, King L., to Phillips Petroleum Company. Method of producing pelleted carbon black. 4,228,143, Cl. 423-445.000.

Cherry, Peter C.; Newall, Christopher E.; and Watson, Nigel S., to Glaxo Laboratories Limited. Azetidinone derivatives. 4,228,074, Cl. 260-239.00A.

Chevron Research Company: *See—*
Hotten, Bruce W., 4,228,282, Cl. 544-296.000.
Lowe, Warren; and Liston, Thomas V., 4,228,022, Cl. 252-42.700.
Suzuki, Shigeto, 4,228,305, Cl. 562-579.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments. 4,227,433, Cl. 84-1.010.

Chicago Lock Co.: *See—*
Steinbach, Robert L., 4,227,387, Cl. 70-363.000.

Chicago Pneumatic Tool Company: *See—*
Whitehill, Cassius F.; Whitehill, Robert D.; and Patel, Ghanshyam C., 4,227,867, Cl. 418-97.000.

Chika, John J. Combined engine and pedal powered vehicles. 4,227,589, Cl. 180-206.000.

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Szebeni, Rudolf; Korbonits, Dezso; Harsanyi, Kalman; Molnar, Leventene; Szekeres, Laszlo; Papp, Gyula; and Sebestyen, Gyula, 4,228,164, Cl. 424-246.000.
Szejtli, Josef; Szente, Lajos; David, Agoston; Virag, Sandor; Sebestyen, Gyula; and Mandi, Attila, 4,228,160, Cl. 424-180.000.

Chiu, Chung W.; and Rutenberg, Morton W., to National Starch and Chemical Corporation. Cold-water dispersible, gelling potato starch. 4,228,199, Cl. 426-578.000.

Chow, Tat-Sing P.: *See—*
Brown, Dale M.; Chow, Tat-Sing P.; Gibbons, James F.; and McConnelee, Paul A., 4,227,944, Cl. 148-6.000.

Christian, Paul A.; Di Salvo, Francis J., Jr.; and Murphy, Donald W., to Bell Telephone Laboratories, Incorporated. Nonaqueous secondary cell using vanadium oxide positive electrode. 4,228,226, Cl. 429-194.000.

Chromalloy American Corporation: *See—*
Sizelove, Cary L.; and Wells, Donald G., 4,227,836, Cl. 406-114.000.

Chung, Tai H.; and Lee, Damong, to P. J. Company. Caster pad. 4,227,281, Cl. 16-29.000.

Chuprov, Gennady S.: *See—*
Ruzin, Leonid M.; Spiridonov, Jury A.; Chuprov, Gennady S.; Tjunkin, Boris A.; and Tabakov, Vladimir P., 4,227,743, Cl. 299-2.000.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; Drabek, Josef; Mattern, Gunter; and Traber, Water, 4,228,175, Cl. 424-273.00R.
Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, 4,227,914, Cl. 71-88.000.
Haeberli, Joerg; Park, Kyong P.; Vellturo, Anthony F.; and Nurnberger, George F., 4,228,297, Cl. 560-75.000.
Hohenegger, Helmut; Baumann, Hanspeter; and Buchel, Urs, 4,227,880, Cl. 8-524.000.
Kainmuller, Thomas; Habermeier, Jurgen; and Buxbaum, Lothar, 4,228,281, Cl. 544-198.000.
Martin, Henry, 4,227,917, Cl. 71-100.000.
Riat, Henri; and Seitz, Karl, 4,228,071, Cl. 260-153.000.

Cir S.p.A. Divisione Sasib: *See—*
Neri, Bruno, 4,227,397, Cl. 73-38.000.

Citizen Watch Company, Limited: *See—*
Murakami, Tomomi, 4,227,777, Cl. 350-334.000.

Clare, George M. Connectors for holding together modular articles. 4,227,758, Cl. 312-107.000.

Clark, Clarence O.; Flautt, Thomas J., Jr.; and Speckman, Donald T., to Procter & Gamble Company, The. Dynamic microwave energy moderator. 4,228,334, Cl. 219-10.55E.

Clark, Ian R.: *See—*
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.

Clarke, Donald L.: *See—*
Wade, Lisby L.; Clarke, Donald L.; and Arrington, Jack P., 4,228,186, Cl. 424-327.000.

Claus, Achim; Geissing, Heinrick; and Ulbrich, Willi, to Siemens Aktiengesellschaft. Circuit for monitoring the current distribution in parallel-connected converted branches. 4,228,477, Cl. 361-87.000.

Clayton, C. William: *See—*
Bonner, John J.; and Clayton, C. William, 4,227,418, Cl. 73-706.000.

Clayton, William: *See—*
Whittaker, Leonard B.; Clayton, William; Marriott, Eric W.; and Strong, Barry C., 4,227,385, Cl. 66-82.00R.

Clewes, Antony B.; and Bowley, Thomas W., to TRW Inc. Module for mounting electrical contacts. 4,227,768, Cl. 339-198.00H.

Clipper, Eddie L., Jr. Display device. 4,227,328, Cl. 40-530.000.

Cobe Laboratories, Inc.: *See—*
Lobdell, Donn D.; and Herman, Stephen J., 4,228,125, Cl. 422-46.000.

Coffey, James M. Wind direction device. 4,227,406, Cl. 73-188.000.

Coffey, William A., to Imperial Chemical Industries Limited. Apparatus for removing heat exchanger tube bundles. 4,227,854, Cl. 414-746.000.

Cohen, Louis, to B. F. Goodrich Company, The. Coating polymerization reactors with oligomers derived from polyhydric phenols plus a bleach. 4,228,130, Cl. 422-131.000.

Cohen, Marshall J.; and Harris, James S., Jr., to Rockwell International Corporation. Schottky barrier solar cell. 4,227,943, Cl. 136-255.000.

Cohnen, Wolfgang: *See—*
Lachmann, Burkhard; Rudolph, Hans; and Cohnen, Wolfgang, 4,228,067, Cl. 260-45.85V.

Colby, Richard A.; Parolini, Leo B.; and Butler, L. Dennis, to Sperry Rand Corporation. Rolling rack control for automatic bale wagon. 4,227,845, Cl. 414-39.000.

Cole, Herbert S., Jr., to General Electric Company. Liquid crystal compositions. 4,228,030, Cl. 252-299.000.

Coleman, Michael G.: *See—*
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,227,298, Cl. 29-837.000.

Collbrunn, Harald; Hannemann, Franz; and Fransing, Heinz, to Durkoppwerke GmbH Bielefeld. Sewing-machine guide for edge-parallel seaming of a workpiece. 4,227,471, Cl. 112-121.260.

Collis, John H. Flexible garment hanger. 4,227,632, Cl. 223-94.000.

Collura, Frank. Multipurpose slag system. 4,227,469, Cl. 110-171.000.

Colombo, Giancarlo; and Ardissone, Alberto, to G.O.R. Applicazioni Speciali S.p.A. Process for producing remoldable panels. 4,228,116, Cl. 264-119.000.

Colquitt, Walter D. Thermometer and doll having capacity to register temperature. 4,227,338, Cl. 46-45.000.

Com Dev Ltd.: *See—*
Harrison, Robert G., 4,228,411, Cl. 333-218.000.

Comer, Robert C., to Toro Company, The. Vacuum/blower attachment for filament trimmer. 4,227,280, Cl. 15-330.000.

Commissariat a l'Energie Atomique: *See—*
Jouve, Hubert; Meyer, Robert; Sztern, Jacques; Krishnan, Ramanathan; Suran, Gabor; and Tessier, Michel, 4,227,947, Cl. 148-122.000.

Communications Satellite Corporation: *See—*
Wachs, Marvin R.; and Berman, Arnold, 4,228,401, Cl. 325-3.000.

Compagnie Francaise de Raffinage: *See—*
Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph E., 4,227,993, Cl. 208-139.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
de Loye, Martin; and Beduchaud, Michel, 4,228,467, Cl. 358-261.000.

Compagnie Lyonnaise de Transmissions Optiques: *See—*
Mignien, Georges, 4,227,951, Cl. 156-158.000.

Compax Corp.: *See—*
Moser, Paul, 4,227,288, Cl. 26-18.600.

CON-TECHNIK GmbH: *See—*
Hesse, Hans G., 4,227,749, Cl. 305-30.000.

Condon, James B.: *See—*
Holcombe, Cressie E., Jr.; Condon, James B.; and Johnson, D. H., 4,228,142, Cl. 423-449.000.

Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Novel cycloheptathiophene intermediates for the synthesis of biotin. 4,228,295, Cl. 549-57.000.

Conklin Company, Inc.: *See—*
Leonard, James D.; and Lewis, Michael J., 4,227,911, Cl. 71-77.000.

Connor, Gerald I., to Bio-Tronics, Inc. Proctologic device for the therapeutic treatment of hemorrhoids. 4,227,535, Cl. 128-401.000.

Conoco, Inc.: *See—*
Dodd, John R., 4,228,311, Cl. 568-805.000.

Conrad, Rene A., to Dynaloc Corporation. Hub-locking device. 4,227,826, Cl. 403-371.000.

Conrad Scholtz AG: *See—*
Gerdes, Heinz; and Blattermann, Karl-Gunther, 4,227,610, Cl. 198-831.000.

Constant, James N., to Constant, James N. Recursive filter. 4,228,517, Cl. 364-724.000.

Container Corporation of America: *See—*
Gardner, Jeffrey M., 4,227,641, Cl. 229-42.000.

Continental Group, Inc., The: *See—*
Hawkins, Jerry D., 4,227,624, Cl. 220-265.000.
Lecinski, Frank H., Jr.; and Banich, John N., Sr., 4,227,616, Cl. 215-246.000.
Zipper, Donald H., 4,227,618, Cl. 215-253.000.
Continental Pharma: *See—*
Lambelin, Georges E.; Gillet, Claude L.; and Roba, Joseph L., 4,228,187, Cl. 424-330.000.
Conway, Ceil L. Angle indicating attachment for drills. 4,227,839, Cl. 408-16.000.
Conway, Hugh T., to Becton, Dickinson and Company. Specimen collecting tube. 4,227,620, Cl. 215-355.000.
Cook, Nathan H.; and Subramanian, Krishnamoorthy, to Massachusetts Institute of Technology. Process for implanting radioactive metal on a substrate. 4,228,338. Cl. 219-76.130.
Cooke, William C., to AFG Industries, Inc. Tamper-proof transparent security plate. 4,228,425, Cl. 340-550.000.
Copal Company Limited: *See—*
Arai, Kiyoyuki, 4,227,793, Cl. 354-246.000.
Corll, James A. Panel for controlling light passage. 4,227,774, Cl. 350-263.000.
Cornell Research Foundation, Inc.: *See—*
Drost, Cornelis J., 4,227,407, Cl. 73-194.00A.
Corning Glass Works: *See—*
Nolan, Daniel A., 4,227,771, Cl. 350-96.330.
Spycher, Anton A., 4,227,950, Cl. 156-85.000.
Cote, Bernard. Ski brake. 4,227,708, Cl. 280-809.000.
Cote, Edmond H., Jr., to Fram Corporation. Fuel oil filter cartridge. 4,228,011, Cl. 210-232.000.
Cottrell, Don J.; and Cottrell, Don M. Car haul trailer. 4,227,734, Cl. 410-12.000.
Cottrell, Don M.: *See—*
Cottrell, Don J.; and Cottrell, Don M., 4,227,734, Cl. 410-12.000.
Country Pride Foods Ltd.: *See—*
Fowler, Douglas, 4,227,938, Cl. 134-10.000.
Courtaulds Limited: *See—*
Smith, Michael D.; Mason, Eric K. L.; and Morley, Robert J., 4,228,208, Cl. 428-95.000.
Covington, Robert A., Jr.; and Ekiner, Okan M., to Du Pont de Nemours, E. I., and Company. Mechanical dewatering apparatus for elastomer slurries. 4,228,005, Cl. 210-207.000.
Cox, Burton B.; and Maroney, Peter F. Safety steering system for outboard motors. 4,227,481, Cl. 440-61.000.
Coyne, Gerard G., to General Electric Company. Split system air conditioner adapted to receive a water preheater. 4,227,382, Cl. 62-324.000.
Creative Tool Company: *See—*
Dooley, Daniel J.; Dooley, Terrence L.; and Dooley, Joseph L., 4,227,402, Cl. 73-115.000.
Dooley, Daniel J.; Dooley, Terrence L.; and Dooley, Joseph L., 4,227,403, Cl. 73-115.000.
Cremer, Heinz P.: *See—*
Gross, Josef; Werner, Heinz; Schmidt, Volker; and Cremer, Heinz P., 4,227,741, Cl. 297-362.000.
Crest Industries, Inc.: *See—*
Rasmussen, Harry R.; and Kimzey, Gene A., 4,228,324, Cl. 179-99.00H.
Crete, Paul G.: *See—*
Williamson, James; and Crete, Paul G., 4,228,434, Cl. 343-5.0AF.
Crews, Donald R., to Caterpillar Tractor Co. Heat exchange structure. 4,227,570, Cl. 165-67.000.
Crockett, Mattie. Lock. 4,227,386, Cl. 70-118.000.
Crofoot, James A.: *See—*
Crofoot, Percy P.; and Crofoot, James A., 4,227,332, Cl. 43-42.250.
Crofoot, Percy P.; and Crofoot, James A. Stone fly nymph. 4,227,332, Cl. 43-42.250.
Crosby, John B., to Beckman Instruments, Inc. Digital ohmmeter with electrical continuity tester. 4,228,394, Cl. 324-62.000.
Crowe, John J., to Union Carbide Corporation. Contoured stamping die. 4,227,396, Cl. 72-469.000.
Crowe, Robert E. Line gripping pulley for a line hauler. 4,227,423, Cl. 474-177.000.
Crowe, Robert E., to Terrafix Erosion Control Products, Inc. Block laying machine. 4,227,834, Cl. 405-303.000.
Cummins Engine Company, Inc.: *See—*
Flynn, Patrick F.; Weber, Harold G.; and Mulloy, John M., 4,227,855, Cl. 415-215.000.
Cunningham, Arthur L. Beam form and shoring structure. 4,227,672, Cl. 249-28.000.
Currieo, Royce A.: *See—*
Maguire, Keith D.; and Currieo, Royce A., 4,227,891, Cl. 55-85.000.
Curry, Willie M.: *See—*
Fisher, Joseph D.; Curry, Willie M.; and Hrinda, Michael E., 4,228,154, Cl. 424-101.000.
Cushman, David W.: *See—*
Ondetti, Miguel A.; and Cushman, David W., 4,228,184, Cl. 424-309.000.
Cushman, James E.: *See—*
Plaza, Mario G.; and Cushman, James E., 4,227,821, Cl. 400-616.300.
Cushman, Robert H., to Pennwalt Corporation. Optimum contrast panoramic dental radiography and methods of providing therefor. 4,228,356, Cl. 250-439.00P.
CY/RO Industries: *See—*
Schmitt, Joseph M., 4,228,256, Cl. 525-302.000.
Cyclops Corporation, Universal-Cyclops Specialty Steel Division: *See—*
Black, Herbert L.; Somerville, Mark; and Schwertz, Jerome, 4,227,927, Cl. 75-225.000.
Cyklop-Gesselschaft, Emil Hoffmann: *See—*
Wehr, Hubert, 4,227,949, Cl. 156-73.500.
Cziment, Norbert. Protective face plate for an electrical outlet. 4,228,317, Cl. 174-67.000.
D-Mark, Inc.: *See—*
Kasmark, James W., Jr.; Dooley, Myron L.; and Jones, Arthur H., 4,227,904, Cl. 55-316.000.
Daido Seiko Kabushiki Kaisha: *See—*
Watanabe, Toshiyuki; Kamiya, Hisao; Shibata, Noriyoshi; and Shimizu, Takayoshi, 4,227,923, Cl. 75-125.000.
Daiichikasei Co., Ltd.: *See—*
Matuura, Katuji, 4,228,204, Cl. 427-372.200.
Dakin, Wayne R.; and Ceshkovsky, Ludwig, to MCA Discovision Inc. System for recording information on a rotatable storage disc, in a substantially uniform recording density. 4,228,326, Cl. 179-100.10G.
Dalbow, Milton H.: *See—*
Acevedo, Hernan F.; Slifkin, Malcolm; and Dalbow, Milton H., 4,228,127, Cl. 422-61.000.
Dalley, Robert J.; Owen, Robert D.; and Parmenter, George S., to Solartron Electronic Group Limited, The. Electrical switching apparatus and energizing circuits therefor. 4,228,412, Cl. 335-152.000.
Daly, Robert E.: *See—*
Gacki, Leonard W.; and Daly, Robert E., 4,227,818, Cl. 366-142.000.
D'Amico, John J., to Monsanto Company. N-Substituted oxobenzothiazoline and oxobenzoxazoline derivatives and their use as plant growth regulants. 4,227,915, Cl. 71-90.000.
D'Amico, John J., to Monsanto Company. N-Substituted benzothiazolines and benzoxazolines and their use as herbicides and plant growth regulants. 4,228,292, Cl. 548-165.000.
Damm, Sverre. Device for coupling, transportation and placing of goods containers. 4,227,843, Cl. 410-54.000.
Dana Corporation: *See—*
Dick, Wesley M., 4,227,427, Cl. 74-467.000.
D'Andrade, Bruce M., to Arco Industries Ltd. Toy automatic pistol for ping pong balls. 4,227,508, Cl. 124-16.000.
Daniels, Wiley E.: *See—*
Pippin, Wallace H.; and Daniels, Wiley E., 4,228,047, Cl. 260-17.4ST.
Dantzer, Elonne: *See—*
Goldfarb, Adolph E.; and Dantzer, Elonne, 4,227,340, Cl. 46-151.000.
Data General Corporation: *See—*
Frissell, John M., 4,228,501, Cl. 364-200.000.
Dataproducts Corporation: *See—*
Palombo, Gaston A.; and Jones, Daniel B., 4,228,396, Cl. 324-163.000.
David, Agoston: *See—*
Szejtli, Josef; Szente, Lajos; David, Agoston; Virag, Sandor; Sebestyen, Gyula; and Mandi, Attila, 4,228,160, Cl. 424-180.000.
David, Harry: *See—*
Ringe, Werner; and David, Harry, 4,227,757, Cl. 312-97.000.
David Satcheil Products Limited: *See—*
Satchell, David C., 4,227,541, Cl. 132-37.00R.
Davidow, William H.: *See—*
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.
Davis, Grover M., to Emmert Manufacturing Co., Inc. Animal exercising apparatus. 4,227,487, Cl. 119-29.000.
Dawson, Edward C.; Homan, Jan D. H.; and Van Weemen, Bauke K., to Akzona Incorporated. Stabilization of peroxidase. 4,228,240, Cl. 435-188.000.
Day, Robert L., to S.D.S. Industries, Inc. Security bar lock. 4,227,724, Cl. 292-145.000.
DBS, Inc.: *See—*
McInnis, Andrew M., 4,227,453, Cl. 101-45.000.
de La Farge, Bertran; and Vincent, Alain, to Institut Technique Du Porc. Electronic air conditioner. 4,227,645, Cl. 236-49.000.
De luxe General, Incorporated: *See—*
Degenkolb, David J.; and Scobey, Fred J., 4,228,013, Cl. 210-264.000.
Dearth, James D.; and Smith, Robert H., to Atlantic Richfield Company. Thermal cracking of retort oil. 4,227,990, Cl. 208-8.00R.
Debono, Manuel: *See—*
Molloy, R. Michael; and Debono, Manuel, 4,228,293, Cl. 548-216.000.
Decaux, Jean-Claude. Sign post. 4,227,329, Cl. 40-607.000.
Deeg, Emil W., to American Optical Corporation. Apparatus for supporting lenses during heat treatment. 4,227,910, Cl. 65-269.000.
Deere & Company: *See—*
Mossman, Michael W.; and Rohweder, Glen W., 4,227,368, Cl. 56-106.000.
De Frank, Michael P.; and Scott, James W., to Baxter Travenol Laboratories, Inc. Sterile air vent. 4,227,527, Cl. 128-214.00R.
Degenkolb, David J.; and Scobey, Fred J., to De luxe General, Incorporated. Method and apparatus for recovery of heavy metal ions from dilute aqueous solution. 4,228,013, Cl. 210-264.000.
De Jager, Johan B.; and Noordanus, Johannes, to U.S. Philips Corporation. Automatic radio telephone system. 4,228,319, Cl. 179-2.0EB.

Del Mar Avionics: *See*—
Ripley, John A.; Woods, Donald C.; and Kaine, James, 4,228,506, Cl. 364-415.000.

Delegard, Robert E.: *See*—
Quigg, Thomas O.; and Delegard, Robert E., 4,227,323, Cl. 37-58.000.

Delettre, Jean-Pierre, to Saint-Gobain Industries. Apparatus for the manufacture of a window by detachment of the edges of a sheet of glass along a score. 4,227,635, Cl. 225-96.500.

Delgado, Alberto W.: *See*—
Blake, David W.; Delgado, Alberto W.; and Sheehan, Gerard M., 4,227,935, Cl. 106-308.00B.

de Loye, Martin; and Beduchaud, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Reduced redundancy facsimile transmission installation. 4,228,467, Cl. 358-261.000.

Del Pesco, Thomas W., to Du Pont de Nemours, E. I., and Company. Method of catalytically preparing tetrahydrofuran/alkylene oxide polymerizates using a montmorillonite clay as the catalyst. 4,228,272, Cl. 528-413.000.

Delta Materials Research Limited: *See*—
Hart, William B.; and Williams, Reginald T., 4,227,646, Cl. 236-93.00R.

Demag A.G.: *See*—
Rahmfeld, Werner; and Kothe, Dieter, 4,227,636, Cl. 226-189.000.

Demers, Robert R., to RCA Corporation. Method of slicing a wafer. 4,227,348, Cl. 51-283.00R.

Dempsey, Russell M.; LaConti, Anthony B.; and Nolan, Mary E., to General Electric Company. Potentiostated, three-electrode, solid polymer electrolyte (SPE) gas sensor having highly invariant background current characteristics with temperature during zero-air operation. 4,227,984, Cl. 204-195.00S.

den Hartog, James: *See*—
Butler, John P.; Rolston, John H.; den Hartog, James; Molson, Fred W. R.; and Goodale, John W., 4,228,034, Cl. 252-430.000.

Dennehey, T. Michael: *See*—
Alexander, John B.; Dennehey, T. Michael; Greff, Richard J.; and Munsch, John M., 4,227,730, Cl. 294-16.000.

Denny, John L.; and Alley, Robert H., to Advance Mining Products, Inc. Method and apparatus for extending conveyor belts. 4,227,660, Cl. 242-86.520.

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Bliss, William E., 4,228,163, Cl. 424-240.000.

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Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.

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Deutsch Fastener Corp.: *See*—
Molina, Jorge W., 4,227,561, Cl. 151-41.740.

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Buchmuller, Horst; and Michelbrink, Bernhard, 4,227,468, Cl. 110-165.00R.

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Ackermann, Rolf; Kolb, Heinz; Morlock, Gerhard; and Schreyer, Gerd, 4,228,084, Cl. 260-348.120.
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Albert, Ernst, 4,227,751, Cl. 308-6.00C.

De Vries, James H.; and Berry, Gaylord L., to Baxter Travenol Laboratories, Inc. Plasma treatment apparatus. 4,228,015, Cl. 210-321.00R.

Dewar, John H.: *See*—
Cairns, Thomas M.; Dewar, John H.; and Sumner, Emmons F., 4,227,761, Cl. 339-66.00M.

Dialog Systems, Inc.: *See*—
Moshier, Stephen L., 4,228,498, Cl. 364-200.000.

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MacMillan, Melvin J., 4,228,159, Cl. 424-175.000.

Dick, Timber. Pedal driven vehicle. 4,227,712, Cl. 280-236.000.

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Dickerson, Henry R. I.V. Pole bracket. 4,227,667, Cl. 248-229.000.

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Fehling, Hans R., 4,227,630, Cl. 222-600.000.

Diessel GmbH & Co.: *See*—
Sanden, Ulrich C., 4,228,192, Cl. 426-231.000.

Diker, Charles M.: *See*—
Moe, Walter; Diker, Charles M.; and Wolf, Harley, 4,227,339, Cl. 46-123.000.
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DiMarzio, Lawrence P. Adjustable soundhole mount for a musical pickup. 4,227,434, Cl. 84-1.140.

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Cardenas, Carlos G.; and Din, Zia U., 4,228,313, Cl. 585-640.000.

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Christian, Paul A.; Di Salvo, Francis J., Jr.; and Murphy, Donald W., 4,228,226, Cl. 429-194.000.

Dodd, John R., to Conoco, Inc. Selective dealkylation of 4-tertiary-alkyl-2,5-xylenol. 4,228,311, Cl. 568-805.000.

Dohse, Jerry L.: *See*—
Murray, Dale L.; and Dohse, Jerry L., 4,227,337, Cl. 46-12.000.

Doljack, Frank A., to B. F. Goodrich Company, The. Monitor system and method for detecting sequential events in a cyclical process. 4,228,513, Cl. 364-550.000.

Dolomite, S.p.A.: *See*—
Annovi, Giuseppe, 4,227,322, Cl. 36-117.000.

Don Allen, Inc.: *See*—
Allen, Donald L., 4,227,557, Cl. 142-7.000.

Donguy, Paul J., to Societe Europeenne de Propulsion. Flexible spherical joint. 4,227,858, Cl. 416-134.00A.

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Dooley, Daniel J.; Dooley, Terrence L.; and Dooley, Joseph L., 4,227,402, Cl. 73-115.000.
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Dooley, Myron L.: *See*—
Kasmark, James W., Jr.; Dooley, Myron L.; and Jones, Arthur H., 4,227,904, Cl. 55-316.000.

Dooley, Terrence L.: *See*—
Dooley, Daniel J.; Dooley, Terrence L.; and Dooley, Joseph L., 4,227,402, Cl. 73-115.000.
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Satoh, Masakazu; Igarashi, Miyuki; and Senoo, Shigeo, 4,227,809, Cl. 356-237.000.

Dow Chemical Company, The: *See*—
Atchison, George J.; McEwen, Gerald K.; and Stevens, Violete L., 4,228,108, Cl. 260-928.000.
Bozzelli, John W.; and Morris, Nancy J., 4,228,096, Cl. 260-459.00A.
Malhotra, Sudarshan K.; and Van Heertum, John C., 4,228,172, Cl. 424-263.000.
Thompson, John W.; Kamp, Arthur J.; and Sederlund, Edward R., 4,228,512, Cl. 364-527.000.
Wade, Lisby L.; Clarke, Donald L.; and Arrington, Jack P., 4,228,186, Cl. 424-327.000.

Dow Corning Corporation: *See*—
Plueddemann, Edwin P., 4,228,061, Cl. 260-31.20R.
Talcott, Thomas D., 4,228,032, Cl. 252-400.00R.

Dowbenko, Rostyslaw: *See*—
Humke, Byron M.; Gruber, Gerald W.; Dowbenko, Rostyslaw; and Friedlander, Charles B., 4,227,979, Cl. 204-159.160.

Dozono, Tetsuro: *See*—
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Drabek, Josef: *See*—
Boger, Manfred; Drabek, Josef; Mattern, Gunter; and Traber, Water, 4,228,175, Cl. 424-273.00R.

Dragerwerk Aktiengesellschaft: *See*—
Warnow, Detlef; and Ziebrecht, Hans-Jorg, 4,227,519, Cl. 128-205.240.
Warnow, Detlef; and Ziebrecht, Hans-Jorg, 4,227,523, Cl. 128-204.240.

Draheim, Frederick: *See*—
Tureaud, Kenneth E.; Ginsburg, Stephen; and Draheim, Frederick, 4,227,877, Cl. 433-37.000.

Draheim, Frederick E.: *See*—
Ginsburg, Stephen J.; and Draheim, Frederick E., 4,227,276, Cl. 15-176.000.

Drake, Robert C. Aim-assisting golf putter. 4,227,694, Cl. 273-164.000.

Drasch, Josef; Firla, Gustav; Rollenitz, Leopold; and Scheiber, Robert, to Vockenhuber, Karl; and Hauser, Raimund. Device for stopping or fixing moving or mobile components. 4,227,783, Cl. 352-194.000.

Dravo Corporation: *See*—
Vlnaty, Joseph, 4,227,892, Cl. 55-89.000.

Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., to Polaroid Corporation. Photographic system accessory for small format film sheets. 4,227,789, Cl. 354-86.000.

Driver, W. B. Downhole flexible drive system. 4,227,584, Cl. 175-95.000.

Droop & Rein, Firma: *See*—
Wittenbreder, Eduard, 4,227,296, Cl. 29-568.000.

Drost, Cornelis J., to Cornell Research Foundation, Inc. Volume flow measurement system. 4,227,407, Cl. 73-194.00A.

DSO "Pharmachim": *See*—
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Dubois, Jean C.; and Barre, Francoise, to Thomson-CSF. Mesogenic products for liquid crystal cells. 4,228,087, Cl. 260-408.000.
Duff, Ian D.: *See*—
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.
DuFort, Edward C., to Hughes Aircraft Company. Limited scan phased array system. 4,228,436, Cl. 343-854.000.
Dufrenne, Gerald, to Unitek Corporation. Voltage regulated capacitive discharge welding power supply. 4,228,340, Cl. 219-113.000.
Duijkers, Peter A., to U.S. Philips Corporation. Picture display device comprising a field deflection circuit and a field blanking circuit. 4,228,464, Cl. 358-165.000.
Dukek, Waldeman: *See*—
Burger, Manfred; Dukek, Waldeman; Gagel, Ernst; Pretchtl, Alfred; and Kalmovicz, Rudolf, 4,227,905, Cl. 62-113.000.
Dummermuth, Ernst: *See*—
Bernhard, Theodore L.; Dummermuth, Ernst; Hoch, Thomas M.; Jaffe, Bruce S.; and Merrell, Gregory L., 4,228,495, Cl. 364-101.000.
Duncan, Dale E.: *See*—
Frazier, Robert D.; and Duncan, Dale E., 4,227,510, Cl. 126-25.00B.
Du Pont de Nemours, E. I., and Company: *See*—
Bouchard, Robert J.; Brixner, Lothar H.; and Popowich, Michael J., 4,228,482, Cl. 361-321.000.
Covington, Robert A., Jr.; and Ekiner, Okan M., 4,228,005, Cl. 210-207.000.
Del Pesco, Thomas W., 4,228,272, Cl. 528-413.000.
Howard, Edward G., Jr.; and Sarafidis, Christos, 4,228,263, Cl. 526-154.000.
Mouissie, Bob, 4,227,767, Cl. 339-176.0MF.
Renner, Carl A., 4,228,302, Cl. 562-408.000.
Sauers, Richard F., 4,228,109, Cl. 260-941.000.
Durango Systems, Inc.: *See*—
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Durant, Graham J.; Emmett, John C.; and Genellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active thiadiazole guanidine compounds. 4,228,291, Cl. 548-138.000.
Durben, Donald M. Stone guard for automobile fender. 4,227,718, Cl. 280-770.000.
Durbin, John A.: *See*—
Bobbe, Richard M.; Durbin, John A.; Lehman, Richard F.; and Seedhouse, Frederick A., 4,227,795, Cl. 355-3.00R.
Durette, Philippe L.: *See*—
Ponpipom, Mitree M.; Bugianesi, Robert L.; Durette, Philippe L.; Katzen, Howard M.; and Shen, Tsung-Ying, 4,228,274, Cl. 536-4.000.
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Durkoppwerke GmbH Bielefeld: *See*—
Collbrunn, Harald; Hannemann, Franz; and Fransing, Heinz, 4,227,471, Cl. 112-121.260.
Durr, Dieter: *See*—
Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, 4,227,914, Cl. 71-88.000.
Durst AG Fabrik Fototechnischer Apparate: *See*—
Pramstraller, Wilhelm, 4,227,804, Cl. 355-67.000.
Dusheck, George J., Jr.; and Scott, Phillips B., to United States of America, Navy. Feature recognition system. 4,228,395, Cl. 324-77.00B.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Alsen, Klaus; Neidhardt, Hans; Maletzke, Jurgen; and Wimmer, Johann, 4,228,114, Cl. 264-33.000.
Dynaloc Corporation: *See*—
Conrad, Rene A., 4,227,826, Cl. 403-371.000.
Dynamit Nobel Aktiengesellschaft: *See*—
El-Chahawi, Moustafa; and Prange, Uwe, 4,228,097, Cl. 260-465.00F.
Kotzsch, Hans-Joachim; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,228,092, Cl. 556-422.000.
Dzus Fastener Co., Inc.: *See*—
Gunther, Conrad J., 4,227,287, Cl. 24-221.00K.
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Lee, Cyril A., 4,228,348, Cl. 235-449.000.
E. R. Squibb & Sons, Inc.: *See*—
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Sprague, Peter W., 4,228,180, Cl. 424-285.000.
E. Sachs & Co. Ltd.: *See*—
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Eakins, Kenneth E.; and Allan, Geoffrey, to Nelson Research & Development Company. Thromboxane inhibition with burimamide. 4,228,176, Cl. 424-273.00R.
Earth Chemical Company: *See*—
Kashihara, Takanobu; Okuda, Fukuyasu; Yamaguchi, Masanaga; and Nishimura, Akira, 4,228,124, Cl. 422-36.000.
East, Robert C. Attachment for a wheelchair. 4,227,740, Cl. 297-310.000.
Eastern Cyclone Industries, Inc.: *See*—
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Eastman Kodak Company: *See*—
Benwood, Bruce R.; and LaChapelle, Paul A., 4,228,480, Cl. 361-235.000.
Campbell, Gerald A.; Hamilton, Lewis R.; and Brust, David P., 4,228,257, Cl. 525-328.000.
Chapman, Derek D.; and Wu, E-Ming, 4,228,073, Cl. 260-176.000.
Kamp, Dennis R.; and Walling, James D., 4,227,796, Cl. 355-3.0DD.
Kaukeinen, Joseph Y.; and Turnblom, Ernest W., 4,228,231, Cl. 430-46.000.
Kuo, Chung-Ming; and Bogan, Richard T., 4,228,276, Cl. 536-76.000.
Losee, David L.; and Wilder, Alvin D., 4,228,452, Cl. 357-59.000.
Milner, Nigel E.; and Payne, Christine C., 4,228,070, Cl. 260-152.000.
Rosenfeld, Robert B., 4,228,230, Cl. 430-3.000.
Eaton Corporation: *See*—
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Larson, Gerald L.; Lane, E. James; and Mueller, Robert S., 4,227,505, Cl. 123-198.00F.
Stratynski, Eugene; and Zilic, Charles, 4,227,412, Cl. 73-368.300.
Uitvlugt, Martin W., 4,227,494, Cl. 123-90.160.
Eberl, Leonhard, to Robert Bosch GmbH. Centrifugal governor, particularly applicable for the alteration of ignition or injection timing in internal combustion engines. 4,227,498, Cl. 123-501.000.
Ebner, Heinrich, to Heinrich Frings GmbH & Co. KG. Ultrafiltration process and apparatus. 4,227,999, Cl. 210-650.000.
Eccles, Brian J.: *See*—
Zorn, Milton J.; Slater, Edward L.; Maizner, Neil L.; Eccles, Brian J.; Minard, Hubert C.; Otsuki, Juko S.; and Sprengart, Daniel H., 4,227,786, Cl. 354-10.000.
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Edison, Robert G. Menthol filter for cigarettes. 4,227,540, Cl. 131-187.000.
Edwin Cooper, Inc.: *See*—
Papay, Andrew G., 4,228,020, Cl. 252-29.000.
Eggenstein, Friedrich: *See*—
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Eisenbrand, Gerhard. N-Substituted alkyl-N-nitrosocarbamoyl azides. 4,228,086, Cl. 260-349.000.
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El-Chahawi, Moustafa; and Prange, Uwe, to Dynamit Nobel Aktiengesellschaft. Method of preparing α-hydroxymethylene nitriles. 4,228,097, Cl. 260-465.00F.
Electric Power Research Institute, Inc.: *See*—
Vaidyanathan, Kumbakonam R.; Henry, Joseph D., Jr.; and Verhoff, Francis H., 4,228,002, Cl. 210-729.000.
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Electronic Implementation Systems, Inc.: *See*—
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Eli Lilly and Company: *See*—
Molloy, R. Michael; and Debono, Manuel, 4,228,293, Cl. 548-216.000.
Zimmerman, Dennis M., 4,228,288, Cl. 546-339.000.
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eMDee Corporation: *See*—
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Davis, Grover M., 4,227,487, Cl. 119-29.000.
Emmett, John C.: *See*—
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Enchelmaier, Harvard W. K. Apparatus for and method of making brushes. 4,227,745, Cl. 300-2.000.
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Laws, William R.; and Reed, Geoffrey R., 4,227,922, Cl. 75-64.000.
Endo, Hirohide: *See*—
Inose, Fumiyuki; Endo, Hirohide; and Komatsu, Akio, 4,228,329, Cl. 200-5.00A.
Engebretsen, Einar O., to Hobart Corporation. Vegetable slicer. 4,227,656, Cl. 241-93.000.
Engel, Gary C. Oil reclamation device. 4,227,969, Cl. 196-115.000.
Engel, Hartmut S.: *See*—
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Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph E., to Compagnie Francaise de Raffinage. Catalysts for the hydrotreatment of hydrocarbons and their utilization. 4,227,993, Cl. 208-139.000.

Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F. Process for preparing epoxy resin. 4,228,271, Cl. 528-95.000.

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Envirotech Corporation: *See*—
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Lewarchik, Ronald J.; Erikson, J. Alden; and Birkmeyer, William J., 4,228,294, Cl. 548-312.000.

Eriksson, Leif. Device for cooling chimney gases. 4,227,647, Cl. 237-2.00B.

Eriksson, Sven E., to Atlas Copco Aktiebolag. Intermeshing pump rotor gears with involute and linear flank portions. 4,227,869, Cl. 418-206.000.

Ernst, Donald J., to Rheem Manufacturing Company. Hanger member. 4,227,668, Cl. 248-317.000.

Esper, Michael J.; Green, Wells L.; and Merchant, Stanley R., to Ford Motor Company. Exhaust gas sensor having porous, metal-impregnated ceramic element. 4,228,128, Cl. 422-98.000.

Espy, Calvin; and Goddlv, Thomas, to Espy, Calvin. Horticulture device for rotating plants due to transpiration and evaporation of moisture. 4,227,343, Cl. 47-39.000.

Estes, Nelson N.: *See*—
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Ethyl Products Company: *See*—
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Ettenberg, Michael; and Nuese, Charles J., to RCA Corporation. III-V Direct-bandgap semiconductor optical filter. 4,228,349, Cl. 250-226.000.

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Ivanov, Jury P.; and Evstafiev, Evgeny A., 4,227,828, Cl. 405-1.000.

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Brown, W. Sumner, 4,228,387, Cl. 318-696.000.
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Johnson, Burnett H., 4,228,066, Cl. 260-45.75C.
Keirns, Mary H.; and Lunt, Robert S., III, 4,227,398, Cl. 73-61.00R.
Lenack, Alain L. P., 4,228,021, Cl. 252-32.70R.
Powers, Kenneth W.; Roper, Robert; and Gorbaty, Martin L., 4,228,254, Cl. 525-256.000.
Stern, Eric P.; Venta, George J.; Mia, Riad; and Vines, Solomon M., 4,227,356, Cl. 52-309.400.
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Ezis, Andre: *See*—
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Fabisak, John S., to GTE Products Corporation. Method of processing glass tubing. 4,228,206, Cl. 428-35.000.

Fagundes, John L. Cotton harvesting apparatus. 4,227,367, Cl. 56-36.000.

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Fan, John C. C.: *See*—
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Fansteel Inc.: *See*—
Berry, Robert W., 4,227,838, Cl. 407-77.000.

Farmer, Stanley E.; and Weinert, Harry F., to Cascade Corporation. Lift truck load clamp for handling paper rolls. 4,227,850, Cl. 414-620.000.

Farris, George A.: *See*—
Keuchel, Herbert W.; and Farris, George A., 4,227,957, Cl. 156-443.000.

Fasano, Osvaldo, to Start S.p.A. Studi Apparecchiature E Ricerche Tecniche. Device for automatic compensation of wear in friction drive clutches of motor vehicles. 4,227,603, Cl. 192-111.00A.

Fehling, Hans R., to Didier-Werke AG. Sliding gates for metallurgical vessels. 4,227,630, Cl. 222-600.000.

Feiner, Alexander; Liu, Chao Kai; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. Variable loop length compensated barrier circuit. 4,228,323, Cl. 179-16.00F.

Feldstein, Nathan. Method for rendering a non-platable semiconductor substrate platable. 4,228,201, Cl. 427-92.000.

Felix, Raymond A., to Stauffer Chemical Company. N-4-(2',2'-Dichlorocyclopropropyl)phenyl 2''-iodobenzamide. 4,228,185, Cl. 424-324.000.

Fellrath, Jean; and Perotto, Jean-Felix, to Centre Electronique Horloger S.A. Electronic watch control device for manual actuation. 4,228,534, Cl. 368-224.000.

Fenimore, Edward E.; and Cannon, Thomas M., to United States of America, Energy. Mosaic of coded aperture arrays. 4,228,420, Cl. 340-146.30F.

Fenton, Emmet D.: *See*—
Foreman, Floyd L.; and Fenton, Emmet D., 4,227,592, Cl. 187-56.000.

Ferguson, Ian; and Lindsay, Robert J., to Imperial Chemical Industries Limited. Chemical process for preparing alkyl esters or the amide of 3-(β,β-dihalovinyl)-2,2-dimethylcyclopropane -carboxylic acid. 4,228,299, Cl. 560-124.000.

Ferruti, Paolo; and Paoletti, Rodolfo. Polymers containing prostaglandin radicals, process for their preparation and use thereof. 4,228,152, Cl. 424-81.000.

Fickert, Werner: *See*—
Pastorek, Emmerich; Orth, Winfried; and Fickert, Werner, 4,228,083, Cl. 260-347.800.

Filtrol Corporation: *See*—
Taylor, Dennis R.; and Jones, Mark, 4,228,137, Cl. 423-118.000.

Finale, Santiago I. Security method and system. 4,227,766, Cl. 339-147.00R.

Finch, David C.: *See*—
Simcoe, Robert J.; and Finch, David C., 4,228,511, Cl. 364-506.000.

Finnerty, Hugh J.: *See*—
Laub, Bernard C., 4,227,710, Cl. 280-47.190.

Fiorentzis, Michael, to BBC Brown Boveri & Company Limited. Method of testing distance relays. 4,228,398, Cl. 324-418.000.

Firla, Gustav: *See*—
Drasch, Josef; Firla, Gustav; Rollenitz, Leopold; and Scheiber, Robert, 4,227,783, Cl. 352-194.000.

Fischer, Hermann, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Sheet feeding apparatus, particularly for rotary printing machines. 4,227,685, Cl. 271-13.000.

Fischer & Porter Company: *See*—
Bonner, John J.; and Clayton, C. William, 4,227,418, Cl. 73-706.000.
Schmoock, Roy F.; and Yard, John S., 4,227,408, Cl. 73-861.170.

Fisher, Charles B.; and Fisher, Sidney T. Air turbulence reducer. 4,227,662, Cl. 244-76.00C.

Fisher, Joseph D.; Curry, Willie M.; and Hrinda, Michael E., to Armour Pharmaceutical Company. Purification of plasma albumin by ion exchange chromatography. 4,228,154, Cl. 424-101.000.

Fisher, Sidney T.: *See*—
Fisher, Charles B.; and Fisher, Sidney T., 4,227,662, Cl. 244-76.00C.

Fiske, Earl D., to Bunker Ramo Corporation. Connector and adapter system. 4,227,764, Cl. 339-121.000.

Fisons Limited: *See*—
Cairns, Hugh; and Ingall, Anthony H., 4,228,173, Cl. 424-269.000.

Fitzer, Robert C., to Minnesota Mining and Manufacturing Company. Low-density abrasive product and method of making the same. 4,227,350, Cl. 51-295.000.

Fives-Cail Babcock: *See*—
Vaillant, Christian; and Korcz, Eugene, 4,227,676, Cl. 254-277.000.

Flanagan, James L., to Bell Telephone Laboratories, Incorporated. Privacy transmission system with remote key control. 4,228,321, Cl. 179-1.50S.

Flautt, Thomas J., Jr.: *See*—
Clark, Clarence O.; Flautt, Thomas J., Jr.; and Speckman, Donald T., 4,228,334, Cl. 219-10.55E.

Fleissner, Hans, to Vepa Aktiengesellschaft. Apparatus for the heat treatment of textiles. 4,227,317, Cl. 34-155.000.

Flick, Gervase M. Medicine container. 4,227,615, Cl. 215-222.000.

Flinchbaugh, Donald E.: *See*—
Zifferer, Morton F.; and Flinchbaugh, Donald E., 4,227,428, Cl. 74-526.000.

Flynn, Patrick F.; Weber, Harold G.; and Mulloy, John M., to Cummins Engine Company, Inc. Turbomachine. 4,227,855, Cl. 415-215.000.

FMC Corporation: *See*—
Hise, Ralph E., 4,228,112, Cl. 261-87.000.
Woods, Quentin T.; and Gerverdinck, William D., 4,227,955, Cl. 156-269.000.

Foam Cutting Engineers, Inc.: *See*—
Pettingell, Winslow L., 4,228,076, Cl. 264-321.000.

Fogel, Maxwell S.; and Magill, Jack M. Orthodontic bracket. 4,227,876, Cl. 433-11.000.

Foley, James W.: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,228,075, Cl. 260-243.300.

Fono, Andrew, to Royce Chemical Company. New process of color stripping dyed textile fabric. 4,227,881, Cl. 8-102.000.

Food Storage Systems, Inc.: *See*—
Means, John E., 4,228,197, Cl. 426-419.000.

Ford Aerospace & Communications Corp.: *See—*
Goudey, Kenneth R.; and Sciambi, Attilio F., Jr., 4,228,410, Cl. 333-122.000.

Ford, Herbert P., Jr., to Exxon Research & Engineering Co. Method and apparatus for time compression of facsimile transmissions. 4,228,469, Cl. 358-288.000.

Ford, James A., to Kirsch Company. Sliders and rail for door support. 4,227,282, Cl. 16-93.00R.

Ford Motor Company: *See—*
Cairns, Thomas M.; Dewar, John H.; and Sumner, Emmons F., 4,227,761, Cl. 339-66.00M.
Esper, Michael J.; Green, Wells L.; and Merchant, Stanley R., 4,228,128, Cl. 422-98.000.
Knapp, Charles A.; and Boyd, Gary L., 4,227,568, Cl. 165-8.000.
Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, 4,227,842, Cl. 409-131.000.

Fordemwalt, James N.: *See—*
Lalumia, Thomas M.; and Fordemwalt, James N., 4,228,448, Cl. 357-46.000.

Foreman, Floyd L.; and Fenton, Emmet D. Duplex door safety recycling system. 4,227,592, Cl. 187-56.000.

Forestier, Serge: *See—*
Lang, Gerard; and Forestier, Serge, 4,228,151, Cl. 424-60.000.

Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, to Ciba-Geigy Corporation. Herbicidal phenoxyalkyloxazolines. 4,227,914, Cl. 71-88.000.

Foster, Arthur M.: *See—*
Tang, David Y.; and Foster, Arthur M., 4,228,085, Cl. 260-348.490.

Foster, Robert B., to Thermco Products Corporation. Method and apparatus for removal of by-products of chemical vapor deposition from oil for vacuum pump. 4,228,004, Cl. 210-739.000.

Foster Wheeler Energy Corporation: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,227,488, Cl. 122-4.00D.

Fowler, Douglas, to Country Pride Foods Ltd. Method of washing egg incubating and/or hatching trays and buggies therefor. 4,227,938, Cl. 134-10.000.

Fox Pool Corporation: *See—*
Russell, Clayton C., 4,227,266, Cl. 4-496.000.

Fram Corporation: *See—*
Cote, Edmond H., Jr., 4,228,011, Cl. 210-232.000.

Frank, Arlen W., to United States of America, Agriculture. Quaternary ureidomethyl phosphonium salts. 4,228,100, Cl. 260-551.00P.

Fransing, Heinz: *See—*
Collbrunn, Harald; Hannemann, Franz; and Fransing, Heinz, 4,227,471, Cl. 112-121.260.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,227,324, Cl. 37-104.000.

Frazier, Claude C.: *See—*
Gray, Harry B.; and Frazier, Claude C., 4,228,035, Cl. 252-431.00R.

Frazier, Robert D.; and Duncan, Dale E. Charcoal briquet lighter. 4,227,510, Cl. 126-25.00B.

Frederick, Allen H.: *See—*
Priel, Ury; Gray, Jerry D.; and Frederick, Allen H., 4,228,451, Cl. 357-51.000.

Frey, Otto, to Sulzer Brothers Limited. Bone implant with plastic insert between elements of different mechanical properties. 4,227,265, Cl. 3-1.913.

Frick Company: *See—*
Andrew, Eduardo V.; Naunas, Robert A., Jr.; and Armstrong, Richard C., Jr., 4,227,862, Cl. 417-12.000.
Laucks, F. Michael; and Stegmann, Rudolph, 4,227,380, Cl. 62-217.000.

Friedlander, Charles B.: *See—*
Humke, Byron M.; Gruber, Gerald W.; Dowbenko, Rostyslaw; and Friedlander, Charles B., 4,227,979, Cl. 204-159.160.

Fries, Soren: *See—*
Timm, Hans; Fries, Soren; and Wenzlaff, Axel, 4,228,014, Cl. 210-321.00R.

Frissell, John M., to Data General Corporation. Data transfer technique for use with peripheral storage devices. 4,228,501, Cl. 364-200.000.

Fritsch, Walter: *See—*
Manshausen, Theodor; and Fritsch, Walter, 4,227,873, Cl. 432-131.000.

Frohberger, Paul-Ernst: *See—*
Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,228,178, Cl. 424-274.000.

Froyman, Abraham. Detachable spout and closure. 4,227,629, Cl. 222-566.000.

Froyman, Abraham: *See—*
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Fuji Electrochemical Co., Ltd.: *See—*
Tsuchida, Takashi; Shinoda, Kenichi; and Takase, Takao, 4,227,701, Cl. 277-12.000.

Fuji Photo Film Co., Ltd.: *See—*
Okutsu, Eiichi; and Hayashi, Katsumi, 4,228,234, Cl. 430-399.000.
Yagihara, Morio; and Yokota, Yukio, 4,228,233, Cl. 430-385.000.

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Yamauchi, Toshiro; Saito, Takemi; and Kanayama, Shigehiro, 4,228,458, Cl. 358-55.000.

Fuji Xerox Co., Ltd.: *See—*
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Fujikura Cable Works Ltd., The: *See—*
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Fujimoto, Ikuo; Ishiki, Setsuya; Kurita, Yoshikazu; and Sato, Yoji, to Fujikura Cable Works Ltd., The. Method for producing crosslinked polyethylenes. 4,228,255, Cl. 525-288.000.

Fujimoto, Yasuo: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.

Fujitsu Limited: *See—*
Kawarada, Kuniyasu; Suzuki, Masao; Ono, Chikai; and Toyoda, Kazuhiro, 4,228,525, Cl. 365-174.000.
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Fukuda, Masataro: *See—*
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,228,145, Cl. 423-644.000.

Fukumori, Yukitsugu: *See—*
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Fukushima, Kenichi: *See—*
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Fukuura, Yukio: *See—*
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Funderburg, William S. Electromagnetic motor. 4,228,373, Cl. 310-20.000.

Futaba Denshi Kogyo K.K.: *See—*
Takagi, Toshinori, 4,227,961, Cl. 156-608.000.

G.O.R. Applicazioni Speciali S.p.A.: *See—*
Colombo, Giancarlo; and Ardissone, Alberto, 4,228,116, Cl. 264-119.000.

G & W Electric Specialty Company: *See—*
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Gabano, Jean-Paul; and Grassien, Jean-Yves, to Saft-Societe des Accumulateurs Fixes et de Traction. Lithium primary cell containing thionyl chloride. 4,228,229, Cl. 429-196.000.

Gacki, Leonard W.; and Daly, Robert E., to Picker Corp. Warming system for fluid mixing and dispensing system. 4,227,818, Cl. 366-142.000.

Gaenzler, Wolfgang: *See—*
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Gaffney, Edward N., to Lucas Industries Limited. Pump for liquids. 4,227,864, Cl. 417-269.000.

Gagel, Ernst: *See—*
Burger, Manfred; Dukek, Waldeman; Gagel, Ernst; Pretchtl, Alfred; and Kalmovicz, Rudolf, 4,227,905, Cl. 62-113.000.

Galerne, Andre. Hyperbaric transfer system. 4,227,524, Cl. 128-205.260.

Galwey, Ronald K.; and Kanazawa, Kay K., to International Business Machines Corporation. Potentiostat for use with electrochemical cells. 4,227,988, Cl. 204-231.000.

Gamble, John G., to Veeder Industries Inc. Electromagnetic counting mechanism. 4,228,347, Cl. 235-92.00C.

Gamble, Robert L.: *See—*
Stewart, Robert D.; and Gamble, Robert L., 4,227,488, Cl. 122-4.00D.

Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage material. 4,228,145, Cl. 423-644.000.

Gar Design Research, Inc.: *See—*
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Garchinsky, John S., to Gar Design Research, Inc. Luminaire raising and lowering system. 4,228,488, Cl. 362-250.000.

Gardner, Jeffrey M., to Container Corporation of America. Partition structure. 4,227,641, Cl. 229-42.000.

Gardner, Lawrence B.; and Hopf, Philip W., to General Motors Corporation. Method of making a horn pad. 4,228,115, Cl. 264-46.400.

Garfinkel, Marvin: *See—*
Brown, Dale M.; and Garfinkel, Marvin, 4,228,212, Cl. 428-209.000.

Garrison, John D. Selective absorber on glass and method for its production. 4,228,220, Cl. 428-434.000.

Garwood, William E.; and Lee, Wooyoung, to Mobil Oil Corporation. Process for separating ethylene from light olefin mixtures while producing both gasoline and fuel oil. 4,227,992, Cl. 208-46.000.

Gat, Daniel, to Technion Research & Development Foundation. Building element for construction of interlocking grids. 4,227,358, Cl. 52-648.000.

Gavrilina, Svetlana A.: *See—*
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.

Gawron, Louis, Jr.; Lindisch, Vincent H.; and Petrucci, John P., to Western Electric Company, Inc. Signal distributor test arrangement. 4,228,328, Cl. 179-175.20R.

Gay, Walter A., to Olin Corporation. Thiolcarbamate derivatives of 3-trihalomethyl-1,2,4-thiadiazoles. 4,228,289, Cl. 548-128.000.

GEC Associates, Inc.: *See*—
Jones, Glenn M., 4,227,509, Cl. 124-23.00R.

Gehl Company: *See*—
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Geiger, Dana F.: *See*—
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Geiger, Erich: *See*—
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Cole, Herbert S., Jr., 4,228,030, Cl. 252-299.000.
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Dempsey, Russell M.; LaConti, Anthony B.; and Nolan, Mary E., 4,227,984, Cl. 204-195.00S.
Dillon, Robert E., 4,227,612, Cl. 206-219.000.
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Hall, Robert N., 4,227,942, Cl. 136-255.000.
Hirsch, Harold H., 4,227,926, Cl. 75-200.000.
Horvay, Julius B., 4,227,383, Cl. 62-344.000.
Lee, Gim F., Jr., 4,228,046, Cl. 260-5.000.
Mac Laury, Michael R., 4,228,308, Cl. 568-726.000.
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Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., 4,227,703, Cl. 277-53.000.
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General Foods Corporation: *See*—
Haas, Gerhard J.; and Stieglitz, Barry, 4,228,191, Cl. 426-45.000.

General Motors Corporation: *See*—
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LaFlame, Frank E., 4,227,861, Cl. 416-169.00A.
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Genna, Sebastian; and Pang, Sing C. Method and apparatus of digital calibration and position analysis of a radiant emission. 4,228,515, Cl. 364-571.000.

GenRad, Inc.: *See*—
Henckels, Lutz; Haas, Rene; and Anderson, Ralph, 4,228,537, Cl. 371-23.000.

Genth, Hermann; Paulus, Wilfried; Schiller, Paul; Sattlegger, Hans; and Schnurrbusch, Karl, to Bayer Aktiengesellschaft. Microbiocidal organopolysiloxane molding compositions. 4,228,065, Cl. 260-45.80N.

George, Darwin E.: *See*—
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George, Douglas: *See*—
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George, Peter K., to National Semiconductor Corporation. Bubble memory with redundant on chip error map storage loops. 4,228,522, Cl. 365-15.000.

Gerber, Bernard; and Leuenberger, Fritz, to Centre Electronique Horloger S.A. Electrically reprogrammable non volatile memory. 4,228,527, Cl. 365-185.000.

Gerdes, Heinz; and Blattermann, Karl-Gunther, to Conrad Scholtz AG. Curved belt conveyor. 4,227,610, Cl. 198-831.000.

Gerry, Martin E. Fuel and water homogenization means. 4,227,817, Cl. 366-127.000.

Gerth, William V. Convertible furniture. 4,227,268, Cl. 5-13.000.

Gertler, Morton; Whicker, Lester F.; and Gibbons, Thomas, to United States of America, Navy. Submarine communications system. 4,227,479, Cl. 114-312.000.

Gerverdinck, William D.: *See*—
Woods, Quentin T.; and Gerverdinck, William D., 4,227,955, Cl. 156-269.000.

Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See*—
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Gewerkschaft Eisenhutte Westfalia: *See*—
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Giacomelli, Edward J.: *See*—
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Gibbons, James F.: *See*—
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Gibbons, Thomas: *See*—
Gertler, Morton; Whicker, Lester F.; and Gibbons, Thomas, 4,227,479, Cl. 114-312.000.

Gierer, Georg, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Hydraulic control system for a hydrodynamic/mechanical transmission. 4,227,597, Cl. 192-3.330.

Gillet, Claude L.: *See*—
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Gillum, Richard R., to Ares, Inc. Anti-bounce apparatus for reciprocating bolt assemblies of automatic cannon. 4,227,439, Cl. 89-190.000.

Gindes, Bernard C., deceased: *See*—
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Gindes, Hanna, executrix: *See*—
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Ginsburg, Stephen: *See*—
Tureaud, Kenneth E.; Ginsburg, Stephen; and Draheim, Frederick, 4,227,877, Cl. 433-37.000.

Ginsburg, Stephen J.; and Draheim, Frederick E. Toothbrush with thermally deformable handle. 4,227,276, Cl. 15-176.000.

Giobbio, Vincenzo, to Marzer S.p.A. Process for preparing pure 2-methyl-3-(β-hydroxyethylcarbamoyl)quinoxaline 1,4-di-N-oxide, and other compounds similar thereto. 4,228,283, Cl. 544-355.000.

Gipp, Roland: *See*—
Blahak, Johannes; Gipp, Roland; Wagner, Kuno; Muler, Erwin; Mazanek, Jan; and Haas, Peter, 4,228,249, Cl. 521-159.000.

Girard, Henry; and Buhler, Rudolf, to Chemap AG. Arrangement for cultivating cells of animal and human tissues. 4,228,242, Cl. 435-284.000.

Glass, John P.: *See*—
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Hollander, Edward F., Jr., 4,227,614, Cl. 206-459.000.

Glass, Joseph M., Jr., to Hughes Tool Company. Rotating stabilizer for shaft drilling. 4,227,585, Cl. 175-325.000.

Glaxo Laboratories Limited: *See*—
Cherry, Peter C.; Newall, Christopher E.; and Watson, Nigel S., 4,228,074, Cl. 260-239.00A.

Glenn, William E., to New York Institute of Technology. Dynamic focusing apparatus and method. 4,227,417, Cl. 73-625.000.

Gliss, Silent: *See*—
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Godfrey, John C., to Bristol-Myers Company. Flushable urinary catheter. 4,227,533, Cl. 128-349.0BV.

Golben, Michael, to Minnesota Mining and Manufacturing Company. Silver recovery cartridge for used fixer of neutral or higher pH. 4,227,681, Cl. 266-170.000.

Gold, Nicholas: *See*—
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Golde GmbH: *See*—
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Golden, Jeffry: *See*—
Ali, A. Wahab; Golden, Jeffry; Eden, J. Gary; Mahaffey, Redge A.; and Pasour, John A., 4,228,407, Cl. 331-94.50P.

Goldfarb, Adolph E.; and Dantzer, Elonne, to Goldfarb, Adolph E. Play set. 4,227,340, Cl. 46-151.000.

Gomez, I. Luis; and Tokas, Edward F., to Monsanto Company. Chemically reducing residual acrylonitrile monomer in nitrile polymers and shaped packaging materials formed therefrom. 4,228,119, Cl. 264-211.000.

Gonmori, Makoto: *See*—
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Goodrich, George W., to Bendix Corporation, The. Colloidal light valve having enhanced image contrast. 4,227,775, Cl. 350-267.000.

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Goodyear Tire & Rubber Company, The: *See*—
Alfio, Deregibus, 4,228,134, Cl. 422-208.000.

Gorbaty, Martin L.; and Taunton, John W., to Exxon Research & Engineering Co. Liquefaction of calcium-containing subbituminous coals and coals of lower rank. 4,227,989, Cl. 208-8.0LE.

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Powers, Kenneth W.; Roper, Robert; and Gorbaty, Martin L., 4,228,254, Cl. 525-256.000.

Goss, Jack, to Extracorporeal Medical Systems, Inc. Mechanism for aurally instructing a patient and method. 4,227,526, Cl. 128-214.00E.

Gouders, Willy: *See*—
Osswald, Gunter; and Gouders, Willy, 4,227,936, Cl. 106-309.000.

Goudey, Kenneth R.; and Sciambi, Attilio F., Jr., to Ford Aerospace & Communications Corp. Microwave circular polarizer. 4,228,410, Cl. 333-122.000.

Gould Inc.: *See*—
Belcher, Richard A., 4,228,417, Cl. 337-252.000.

Gourdier, Jean F.: *See*—
Senes, Michel; Le Goff, Yannick; Gourdier, Jean F.; and Quibel, Jacques, 4,228,039, Cl. 252-462.000.

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Gozzo, Franco; Abbruzzese, Luigi; and Siddi, Giorgio, to Montedison S.p.A. Two dichloroacetamide antidotes for non-selective herbicides particularly active in the protection of maize against the poisonous action exerted by herbicides esters of N,N-disubstituted glycine. 4,228,101, Cl. 260-561.0HL.

Gradwohl, Donald R.; and Gradwohl, Jonald R. Convertible hand truck-wagon. 4,227,709, Cl. 280-47.110.

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Gradwohl, Donald R.; and Gradwohl, Jonald R., 4,227,709, Cl. 280-47.110.

Grafische Onderneming Mago B.V.: *See*—
Haazebroek, Arnold, 4,228,211, Cl. 428-203.000.

Granda, Edward J.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,228,026, Cl. 252-174.110.

Grant, Walter H., Jr. Liquid metering valve. 4,227,674, Cl. 251-15.000.

Grantham, Daniel H., to United Technologies Corporation. Hydrogen gas generation utilizing a bromide electrolyte, a boron phosphide semiconductor and radiant energy. 4,227,977, Cl. 204-129.000.

Granzow, Albrecht H., to American Cyanamid Company. Flame-retardant, polyphenylene-ether resin compositions containing a 2,5,5-trisubstituted 1,3,2-dioxaphosphorinane-2-oxide. 4,228,063, Cl. 260-45.70P.

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Gray, Harry B.; and Frazier, Claude C., to California Institute of Technology. Irradiated polymer supported metal catalyst. 4,228,035, Cl. 252-431.00R.

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Gray, Reed A.; Tseng, Chien K.; and Rusay, Ronald J., to Stauffer Chemical Company. 1-Hydroxy-2-(alkylketo)-4,4,6,6-tetramethyl cyclohexen-3,5-dione herbicides. 4,227,919, Cl. 71-122.000.

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Green, Wells L.: *See*—
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Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, to Hoffmann-La Roche Inc. Process for the preparation of methyl 3,4-anhydro-2,6-dideoxy-L-ribohexopyranoside. 4,228,080, Cl. 260-345.90R.

Greve, Manfred, to Sandoz Ltd. 1-(N-alkyl-n-benzyl or substituted benzyl-N-methyl(ammonium)alkyl)-3-cyano-4-alkyl-5-(alkyl-halophenyl)azo-6-hydroxypyridone-2 compounds. 4,228,072, Cl. 260-156.000.

Grew, Raymond E.: *See*—
Karol, Robert J.; and Grew, Raymond E., 4,228,008, Cl. 210-198.00C.

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Brewer, Malcolm D.; and Griffin, Gerald J. L., 4,228,149, Cl. 424-14.000.

Griffith, Carl D., to Sperry Corporation. Aircraft servoactuator apparatus. 4,228,386, Cl. 318-628.000.

Groninger, Kurd. Apparatus for contacting samples with water vapors. 4,227,399, Cl. 73-76.000.

Grooms, William L., Jr.: *See*—
Bowers, William, Jr.; and Grooms, William L., Jr., 4,227,429, Cl. 81-90.00C.

Grosch, Karl; Moitzheim, Paul; and Schloesser, Gert, to Uniroyal GmbH. Bead construction for a heavy duty pneumatic tire. 4,227,563, Cl. 152-354.00R.

Gross, Josef; Werner, Heinz; Schmidt, Volker; and Cremer, Heinz P., to Keiper Automobiltechnik GmbH & Co. KG. Backlash free seat adjuster. 4,227,741, Cl. 297-362.000.

Grotkopp, Detlef; Wedemeyer, Karlfried; Brandes, Wilhelm; Scheinpflug, Hans; and Roessler, Peter, to Bayer Aktiengesellschaft. Combating pests with 3,3-dimethylindan-5-yl N-alkyl-carbamic acid esters. 4,228,181, Cl. 424-300.000.

Gruber, Gerald W.: *See*—
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Grudzinskas, Charles V.: *See*—
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GTE Products Corporation: *See*—
Fabisak, John S., 4,228,206, Cl. 428-35.000.
Lovely, John D., 4,228,456, Cl. 358-20.000.
Milburn, Zachariah H., Jr., 4,228,370, Cl. 307-291.000.
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Wolfe, Paul G., 4,228,457, Cl. 358-21.00R.

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Gulf Research & Development Company: *See*—
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,023, Cl. 252-63.000.
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,024, Cl. 252-63.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,228,036, Cl. 252-437.000.

Gunn, Duncan A., to International Standard Electric Corporation. Submarine fiber optic cable. 4,227,770, Cl. 350-96.230.

Gunther, Conrad J., to Dzus Fastener Co., Inc. Full ejection stud assembly. 4,227,287, Cl. 24-221.00K.

Gunther, Roland; and Koster, Karl H., to Gutehoffnungshutte Sterkrade A.G. Bucket conveyor. 4,227,609, Cl. 198-711.000.

Gupta, Ram K.; and Vora, Chandrakant R., to Burroughs Corporation. Template micromemory structure for a pipelined microprogrammable data processing system. 4,228,497, Cl. 364-200.000.

Gurley, James R. Internal combustion engine. 4,227,506, Cl. 123-227.000.

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Guscott, John K.; Renner, Gerard; and Wendt, Roger, to American District Telegraph Company. Diaphragm type piezoelectric electroacoustic transducer. 4,228,379, Cl. 310-322.000.

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Guternic AB: *See*—
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Gutierrez, William A.; and Pollard, John H., to United States of America, Army. Monolithic infrared focal plane charge coupled device imager. 4,228,365, Cl. 307-221.00D.

Gutridge, Jack E.; and Marulic, Walter J., to Pullman Incorporated. Upper berth support arrangement. 4,227,465, Cl. 105-321.000.

Guy, Bernard F. R.; and Lacroix, Michel A. B., to Le Materiel Telephonique. Flight-control electro-hydraulic simulator. 4,227,319, Cl. 35-12.00S.

Guyton, James H. Antenna system using antenna base impedance transforming means. 4,228,544, Cl. 455-282.000.

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H. H. Robertson Company: *See*—
Bricmont, Robert J.; Hamilton, Philip A.; and Ting, Raymond M. L., 4,227,593, Cl. 188-1.00C.

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Haas, Gerhard J.; and Stieglitz, Barry, to General Foods Corporation. Microbiological decaffeination of aqueous liquids. 4,228,191, Cl. 426-45.000.

Haas, Peter: *See*—
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Haglund, Sture, to ITT Industries, Inc. Apparatus for connecting a lifting tackle to a submersible pump. 4,227,733, Cl. 294-83.00R.
Hall, Hubert L., deceased (by Roberts, Noel S., executor), to Calcimatic International Limited. Rotary hearth for calcining kiln. 4,227,875, Cl. 432-239.000.
Hall, Robert N., to General Electric Company. Photovoltaic semiconductor devices and methods of making same. 4,227,942, Cl. 136-255.000.
Hallam, Dennis M., to E. Sachs & Co. Ltd. Roof gutter. 4,227,352, Cl. 52-11.000.
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Hart, Dennis; and Shiroishi, Masaru, to Under Sea Industries, Inc. Air system for scuba diving. 4,227,521, Cl. 128-202.140.
Hart, William B.; and Williams, Reginald T., to Delta Materials Research Limited. Temperature-responsive valve. 4,227,646, Cl. 236-93.00R.
Hartenstein, Johannes; Satzinger, Gerhard; Herrmann, Manfred; and Heldt, Wolfgang, to Warner-Lambert Company. 3-Oxo-2-azaspiro-2-(N-methyl)-acetamides. 4,228,179, Cl. 424-274.000.
Hartman, Robert J.: *See*—
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Hatanaka, Masayoshi: *See*—
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Hawkins, Jerry D., to Continental Group, Inc., The. Pull tab closure. 4,227,624, Cl. 220-265.000.
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Heredy, Laszlo A.; and McCoy, Lowell R., to Rockwell International Corporation. Positive electrode for electrical energy storage device. 4,228,224, Cl. 429-112.000.
Herlin, Bernard. Machine for producing reinforcements, in particular for reinforced concrete, and the reinforcements produced thereby. 4,228,335, Cl. 219-56.000.
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Hoffa, Jack L., to Beckman Instruments, Inc. Magnetic stirrer for sample container of photometric analyzer. 4,227,815, Cl. 356-436.000.
Hofferbert, William L., Jr.; and Preston, Jack, to Monsanto Company. Solution annealing of aramid and structurally related fibers. 4,227,885, Cl. 8-925.000.
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Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,228,295, Cl. 549-57.000.
Grethe, Guenter; Uskokovic, Milan R.; and Sereno, John, 4,228,080, Cl. 260-345.90R.
Karol, Robert J.; and Grew, Raymond E., 4,228,008, Cl. 210-198.00C.
Hofling, Peter, to O & K Orenstein & Koppel Aktiengesellschaft. Driving unit for escalators for driving the step band. 4,227,605, Cl. 198-331.000.
Hohenegger, Helmut; Baumann, Hanspeter; and Buchel, Urs, to Ciba-Geigy Corporation. Process for the production of dustfree granules of dyes and optical brighteners. 4,227,880, Cl. 8-524.000.
Holcombe, Cressie E., Jr.; Condon, James B.; and Johnson, D. H. Process for producing diamond-like carbon. 4,228,142, Cl. 423-449.000.
Hold, Peter; and Tadmor, Zehev, to USM Corporation. Rotary processor. 4,227,816, Cl. 366-99.000.
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Brinkman, Willem, 4,227,499, Cl. 123-499.000.
Holland, David; Milner, David J.; and Huff, Roger K., to Imperial Chemical Industries Limited. Polyhalogenated hydrocarbons, useful as insecticide intermediates, and methods for their preparation. 4,228,107, Cl. 570-134.000.
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Avalon, Max; Kowalski, John L.; and Tippetts, K. Boyd, 4,227,289, Cl. 29-33.00K.
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Hooker, Rea F. Polyhedral annular structures, and blanks therefor. 4,227,334, Cl. 46-1.00L.
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Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,228,440, Cl. 346-75.000.
Hornyak, Emery J., Jr.; Perry, Philip D.; and Sherman, James E., to Owens-Illinois, Inc. Electric forehearth and method of melting therein. 4,227,909, Cl. 65-135.000.
Horvay, Julius B., to General Electric Company. Refrigerator including through-the-door ice service. 4,227,383, Cl. 62-344.000.
Hosoi, Yuzo; Shinoda, Noboru; Tsuchida, Yutaka; Sekino, Shozo; Sakakihara, Mizuo; and Murota, Shoji, to Nippon Steel Corporation. Heat-resistant alloy for welded structures. 4,227,925, Cl. 75-171.000.
Hotten, Bruce W., to Chevron Research Company. Lubricating oil additive. 4,228,282, Cl. 544-296.000.
Houlihan, William J., to Sandoz, Inc. 2-Keto-4,5-dihydro-3 (2H)-pyridazinones, and their use in treating muscle tension. 4,228,166, Cl. 424-250.000.
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Howell, Alexander G., Jr.; and Settle, Evan E., III, to Reynolds Metals Company. Solar distillation apparatus. 4,227,970, Cl. 202-234.000.
Hoy, Leslie R. J.; and Saggers, Malcolm J., to Imperial Chemical Industries Limited. Aromatic polyether sulfone used as a prime coat for a fluorinated polymer layer. 4,228,219, Cl. 428-422.000.
Hrescak, Stan, to B. C. Gearworks Ltd. Hydraulic winch. 4,227,680, Cl. 254-344.000.
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Scales, Stanley R.; and Sullivan, Eric C., 4,228,339, Cl. 219-77.000.
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Hulyalkar, Ramchandra K.; and Lauzon, Rodrigue V., to Syntex (U.S.A.) Inc. Flame retardant latexes. 4,228,058, Cl. 260-29.7UA.
Humbert, Marcel E. Wire wound disc armature for dynamoelectric machine. 4,228,378, Cl. 310-268.000.
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Humphreys, James R. Aircraft propeller pitch control. 4,227,860, Cl. 416-155.000.
Hunter, Walter D., to Texaco Development Corp. Secondary recovery process. 4,228,016, Cl. 252-8.55D.
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Hurt, Henry W., to Lubbock Manufacturing Company. Isolation frame. 4,227,578, Cl. 172-40.000.
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Hydes, Paul C.; and Watkins, David M., to Johnson, Matthey & Co., Limited. Compositions containing platinum. 4,228,090, Cl. 260-429.00R.
Ibuki, Koji; Ueda, Yoshihiro; and Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Gas pressure circuit interrupter. 4,228,332, Cl. 200-148.00R.
Ide, Hiroyuki: *See*—
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Ikawa, Kunio, to Toyo Kogyo Co., Ltd. Non-tarnishing panel edge spot welding arrangement. 4,227,824, Cl. 403-271.000.
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Imamura, Yuzo. Method of producing radioactive carbon powder. 4,228,146, Cl. 424-1.000.
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Barclay, Donald J.; Bird, Colin L.; Hallett, Michael H.; and Martin, David H., 4,228,431, Cl. 340-719.000.
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Galwey, Ronald K.; and Kanazawa, Kay K., 4,227,988, Cl. 204-231.000.
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International Paper Company: *See*—
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International Radioimmune Systems, Inc.: *See*—
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International Shoe Machine Corporation: *See*—
Becka, Michael M., 4,227,483, Cl. 118-411.000.
International Standard Electric Corporation: *See*—
Gunn, Duncan A., 4,227,770, Cl. 350-96.230.
International Telephone and Telegraph Corporation: *See*—
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Tjaden, Jan, 4,227,571, Cl. 165-167.000.
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Robyt, John F.; and Zikopoulos, John N., 4,228,150, Cl. 424-48.000.
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Ishizaki, Yoshihiro. Cooling system. 4,227,376, Cl. 62-434.000.
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Itaya, Reijiro, to Itaya Seisakusho Co., Ltd. Spring winding machine. 4,227,392, Cl. 72-137.000.
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ITT Industries, Inc.: *See*—
Haglund, Sture, 4,227,733, Cl. 294-83.00R.
Schopper, Bernd; and Tandler, Peter, 4,227,746, Cl. 303-6.00R.
Iura, Yukio: *See*—
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Higashizume, Ryuichi; and Iyoku, Masahiko, 4,228,267, Cl. 526-328.500.
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J. C. Schumacher Co.: *See*—
Schumacher, John C., 4,227,291, Cl. 29-572.000.
J. I. Case Company: *See*—
Schmitz, Floyd A.; and Joy, William F., 4,227,852, Cl. 414-694.000.
J & M Instruments Corp.: *See*—
Elkins, Joseph R., 4,227,414, Cl. 73-425.40R.
Jackson, Joseph N. Programmable television receiver controllers. 4,228,543, Cl. 455-181.000.
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Jacob, Robert I.; and Jacob, Paul E., 4,227,515, Cl. 126-427.000.
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Bernhard, Theodore L.; Dummermuth, Ernst; Hoch, Thomas M.; Jaffe, Bruce S.; and Merrell, Gregory L., 4,228,495, Cl. 364-101.000.
Jaggle, Gunther: *See*—
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Jahn, Wolfgang, to Maschinen und Werkzeugfabrik Kabel Vogel & Schemmann, Firma. Centrifugal wheel assembly for spraying apparatus. 4,227,351, Cl. 51-434.000.
Jakstys, Milda M.; Tom, Baldwin H.; and Kahan, Barry D., to Northwestern University. Process of producing carcinoembryonic antigen. 4,228,236, Cl. 435-1.000.
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Jansson, Conny; and Wahlberg, Ulf, to AB Bahco Verktyg. Hand tool. 4,227,430, Cl. 81-177.00M.
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Sugikawa, Susumu; Maeda, Mitsuru; and Tsujino, Takeshi, 4,228,141, Cl. 423-415.00A.
Wakayama, Naoaki; Iida, Toshiyuki; and Yamagishi, Hideshi, 4,228,355, Cl. 250-374.000.
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Yoshida, Yoshinori; and Shinohara, Hironobu, 4,228,301, Cl. 560-244.000.
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Jeck, Rudiger, to Sandoz Ltd. 4-Biphenylyl-4-hydroxyalkan-2-ones. 4,228,105, Cl. 568-325.000.
Jensen, James D.; and Schoolar, Richard B., to United States of America, Navy. Growth technique for preparing graded gap semiconductors and devices. 4,227,948, Cl. 148-175.000.
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MacMunn, George D.; and Brennan, Ward T., 4,227,666, Cl. 246-187.00C.
Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Transfer drum for sheet-fed rotary printing presses. 4,227,459, Cl. 101-415.100.
Jetzer, Raimund, to Gewerbebank Baden Aktiengesellschaft. Method of processing waste materials. 4,227,653, Cl. 241-24.000.
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Reed, Robert D., 4,227,897, Cl. 55-269.000.
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Walser, Mackenzie, 4,228,099, Cl. 260-501.110.
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Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,227,960, Cl. 156-519.000.

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Johnson, Carlton A., to Peabody Process System, Inc. Flue gas scrubbing process using fly ash alkali. 4,228,139, Cl. 423-242.000.
Johnson, D. H.: *See*—
Holcombe, Cressie E., Jr.; Condon, James B.; and Johnson, D. H., 4,228,142, Cl. 423-449.000.
Johnson, Matthey & Co., Limited: *See*—
Hydes, Paul C.; and Watkins, David M., 4,228,090, Cl. 260-429.00R.
Sermon, Paul A., 4,228,138, Cl. 423-239.000.
Johnson, Michael R.; and Milne, George M., to Pfizer Inc. 1,9-Dihydroxyoctahydrobenzo[c]quinolines and 1-hydroxyhexahydrobenzo[c]quinoline-9(8H)-ones as antiemetic agents. 4,228,169, Cl. 424-258.000.
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Kerber, Dathan R.; Johnson, Orlin W.; Week, Robert D.; Benson, Richard E.; VandeWiele, John L.; and Lucas, James R., 4,227,363, Cl. 56-10.200.
Johnson, Steven A. Multiple-phase flowmeter and materials analysis apparatus and method. 4,228,353, Cl. 250-356.000.
Johnson, Walter J.; and Selis, James J., to Boeing Company, The. Character generator. 4,228,510, Cl. 364-521.000.
Johnston, Bruce L., to Burke, Inc. Adjustable bed. 4,227,269, Cl. 5-66.000.
Johnston, Harry L., Sr. Computer for metric conversion. 4,228,516, Cl. 364-602.000.
Johnstone, Malcolm D. LED flasher for battery cell-powered lamp. 4,228,484, Cl. 362-184.000.
Jones, Arthur H.: *See*—
Kasmark, James W., Jr.; Dooley, Myron L.; and Jones, Arthur H., 4,227,904, Cl. 55-316.000.
Jones, Daniel B.: *See*—
Palombo, Gaston A.; and Jones, Daniel B., 4,228,396, Cl. 324-163.000.
Jones, Glenn M., to GEC Associates, Inc. Archery bow having continually decreasing draw force during draw. 4,227,509, Cl. 124-23.00R.
Jones, Leslie; and Paradis, Roger. Sealed tub. 4,227,621, Cl. 217-96.000.
Jones, Mark: *See*—
Taylor, Dennis R.; and Jones, Mark, 4,228,137, Cl. 423-118.000.
Jones, Philip E.: *See*—
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Jones, Trevor C., to Underground Location Services Limited. Pipeline pig having gauging plate. 4,227,309, Cl. 33-178.00E.
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Westermann, Donald H.; Sawicki, John E.; and Huige, Nicolaas J., 4,228,188, Cl. 426-11.000.
Jouve, Hubert; Meyer, Robert; Sztern, Jacques; Krishnan, Ramanathan; Suran, Gabor; and Tessier, Michel, to Commissariat a l'Energie Atomique; and Agence Nationale de Valorisation de la Recherche (ANVAR). Method for modifying the easy direction of magnetization of an amorphous magnetic film. 4,227,947, Cl. 148-122.000.
Joy-can Safety Products, Ltd.: *See*—
Joyner, Joseph C., 4,227,735, Cl. 296-24.00R.
Joy, William F.: *See*—
Schmitz, Floyd A.; and Joy, William F., 4,227,852, Cl. 414-694.000.
Joyce, Robert J.: *See*—
Takahashi, Yoshihiro; Moore, Robert T.; and Joyce, Robert J., 4,227,887, Cl. 23-230.0PC.
Joyner, Joseph C., to Joy-can Safety Products, Ltd. Protective enclosure for a bus driver. 4,227,735, Cl. 296-24.00R.
Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Mages, Bernhard, 4,227,750, Cl. 308-3.800.
Justus, Edgar J., to Beloit Corporation. Paper winder assembly including pressure modulating valve. 4,227,658, Cl. 242-66.000.
K-Jack Engineering Company, Inc.: *See*—
Chalabian, Jack S., 4,227,604, Cl. 194-102.000.
Kabel- und Metallwerke Gutehoffnungshutte AG: *See*—
Blumenberg, Gunther, 4,227,639, Cl. 228-173.00F.
Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,227,456, Cl. 101-291.000.
Kabushikikaisha Anoa: *See*—
Ishizuki, Saburo, 4,227,698, Cl. 273-309.000.
Kahan, Barry D.: *See*—
Jakstys, Milda M.; Tom, Baldwin H.; and Kahan, Barry D., 4,228,236, Cl. 435-1.000.
Kaine, James: *See*—
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Kainmuller, Thomas; Habermeier, Jurgen; and Buxbaum, Lothar, to Ciba-Geigy Corporation. Dicarboxylic acids containing triazine rings. 4,228,281, Cl. 544-198.000.
Kajiyama, Tisato: *See*—
Takayanagi, Motowo; and Kajiyama, Tisato, 4,228,218, Cl. 525-58.000.
Kakimoto, Kunihiko; and Kodaira, Masaru, to Nissan Motor Company, Limited. Motor vehicle equipped with turbocharger. 4,227,372, Cl. 60-602.000.
Kalker, Philip E.: *See*—
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Kalmovicz, Rudolf: *See*—
Burger, Manfred; Dukek, Waldeman; Gagel, Ernst; Pretchtl, Alfred; and Kalmovicz, Rudolf, 4,227,905, Cl. 62-113.000.
Kalopissis, Gregoire; Zysmann, Alexandre; Sebag, Henri; Vanlerberghe, Guy; Huron, Jean-Louis; and Bugaut, Andree, to L'Oreal. Water-soluble cationic polymer dye compounds and process for producing the same. 4,228,259, Cl. 525-435.000.
Kaltenbach & Voigt GmbH: *See*—
Lohn, Gerd, 4,227,878, Cl. 433-80.000.
Kamekawa, Kunio; and Yagi, Sumio, to Yamaha Hatsudoki Kabushiki Kaisha. Air cleaner. 4,227,898, Cl. 55-276.000.
Kamiya, Hisao: *See*—
Watanabe, Toshiyuki; Kamiya, Hisao; Shibata, Noriyoshi; and Shimizu, Takayoshi, 4,227,923, Cl. 75-125.000.
Kamp, Arthur J.: *See*—
Thompson, John W.; Kamp, Arthur J.; and Sederlund, Edward R., 4,228,512, Cl. 364-527.000.
Kamp, Dennis R.; and Walling, James D., to Eastman Kodak Company. Electrographic apparatus having improved developer metering construction. 4,227,796, Cl. 355-3.0DD.
Kanagawa, Shuichi: *See*—
Kudo, Ken-ichi; Kitagawa, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,228,266, Cl. 526-283.000.
Kanayama, Shigehiro: *See*—
Yamauchi, Toshiro; Saito, Takemi; and Kanayama, Shigehiro, 4,228,458, Cl. 358-55.000.
Kanazawa, Kay K.: *See*—
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Kanebo, Ltd.: *See*—
Saito, Toshio; Oguchi, Masao; and Kisaichi, Akio, 4,227,882, Cl. 8-115.500.
Kanner, Gary L.; Kohler, Samuel H.; and Lewis, Robert E., to Schick Incorporated. Collapsible cordless electric hair curling appliance. 4,228,343, Cl. 219-225.000.
Kanngiesser, Karl W.: *See*—
Hausler, Michael; and Kanngiesser, Karl W., 4,228,492, Cl. 363-48.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
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Murakami, Takeshi; Nakamura, Teruo; and Yagi, Hisanori, 4,228,222, Cl. 428-500.000.
Kapanen, Aarne A.: *See*—
Lindroos, Leo E.; Turpeinen, Ahti E.; and Kapanen, Aarne A., 4,228,133, Cl. 422-195.000.
Kapoor, Vinod, to Butler Greenwich Inc. Ink fountain drive mechanism. 4,227,458, Cl. 101-350.000.
Karlsson, Bertil, to Ingenjorsfirman Percy Blanck AB. Lock nut. 4,227,560, Cl. 151-24.000.
Karol, Robert J.; and Grew, Raymond E., to Hoffmann-La Roche Inc. Chromatographic device for simultaneous collection and evaporation of sequential volatile non-aqueous eluates. 4,228,008, Cl. 210-198.00C.
Karpacheva, Susanna M.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.
Kartinian, Alfred. Key holder. 4,227,389, Cl. 70-456.00R.
Kashihara, Takanobu; Okuda, Fukuyasu; Yamaguchi, Masanaga; and Nishimura, Akira, to Earth Chemical Company. Fumigating method and apparatus. 4,228,124, Cl. 422-36.000.
Kashiwahara, Katsuto: *See*—
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.
Kasmark, James W., Jr.; Dooley, Myron L.; and Jones, Arthur H., to D-Mark, Inc. Gas phase permeable filter. 4,227,904, Cl. 55-316.000.
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Boos, Charles J.; Hausler, Elwood B.; Hirsch, James A.; Kasprzyk, Martin R.; and Smith, Elmer G., 4,228,344, Cl. 219-270.000.
Kato, Fumio: *See*—
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.
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Sorimachi, Akira, 4,227,726, Cl. 292-251.500.
Katsumata, Tsutomu: *See*—
Aoki, Kunitoshi; Honda, Makoto; Dozono, Tetsuro; and Katsumata, Tsutomu, 4,228,098, Cl. 260-465.300.
Katzen, Howard M.: *See*—
Ponpipom, Mitree M.; Bugianesi, Robert L.; Durette, Philippe L.; Katzen, Howard M.; and Shen, Tsung-Ying, 4,228,274, Cl. 536-4.000.
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., to Tandem

Computers Incorporated. Multiprocessor system. 4,228,496, Cl. 364-200.000.

Kaufman, Jay S.: *See*—
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Kaufman, Lynn E.; and Kaufman, Jay S. Farrowing pen. 4,227,486, Cl. 119-28.000.

Kaukeinen, Joseph Y.; and Turnblom, Ernest W., to Eastman Kodak Company. Color electrophotographic process, apparatus and recording element useful therein. 4,228,231, Cl. 430-46.000.

Kaul, William A., Jr. Ring toy. 4,227,341, Cl. 46-220.000.

Kavlico Corporation: *See*—
Park, Kyong. 4,227,419, Cl. 73-724.000.

Kawaguchi, Hiroshi, to Toyota Kidosha Kogyo Kabushiki Kaisha. Pressure control device for a vehicle brake. 4,227,747, Cl. 303-24.00C.

Kawano, Shigeyoshi: *See*—
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.

Kawarada, Kuniyasu; Suzuki, Masao; Ono, Chikai; and Toyoda, Kazuhiro, to Nippon Telegraph and Telephone Public Corporation; and Fujitsu Limited. Semiconductor integrated circuit device. 4,228,525, Cl. 365-174.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nishikawa, Yoshiyasu; Harada, Chosei; and Nakano, Masao, 4,227,868, Cl. 416-186.00R.
Oguni, Hiroshi; Ishiko, Masahiro; and Nakayama, Kazuyoshi, 4,227,442, Cl. 91-392.000.

Kawashima, Yoshinori; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Chain device. 4,227,422, Cl. 474-156.000.

Kay, David A. R.: *See*—
Subramanian, Sundaresa V.; Ghosh, Debabrata S.; Gray, John M.; Kay, David A. R.; and Purdy, Gary R., 4,227,924, Cl. 75-130.00R.

Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., to Motorola, Inc. Method for interconnecting photovoltaic devices. 4,227,298, Cl. 29-837.000.

Keiper Automobiltechnik GmbH & Co. KG: *See*—
Gross, Josef; Werner, Heinz; Schmidt, Volker; and Cremer, Heinz P., 4,227,741, Cl. 297-362.000.

Keirns, Mary H.; and Lunt, Robert S., III, to Exxon Research & Engineering Co. Piezoelectric gum measurement device. 4,227,398, Cl. 73-61.00R.

Keiser, Dennis L., to Kintron, Incorporated. Exercising device including linkage for control of muscular exertion required through exercising stroke. 4,227,689, Cl. 272-130.000.

Kelleher, John M.: *See*—
Erickson, John W.; and Kelleher, John M., 4,227,865, Cl. 417-365.000.

Kellstrom, Magnus, to SKF Industries, Inc. Rolling bearing. 4,227,754, Cl. 308-177.000.

Kendall Company, The: *See*—
Marshall, Preston F., 4,228,123, Cl. 264-557.000.
Taylor, Glenn N., 4,227,293, Cl. 29-447.000.

Kennecott Copper Corporation: *See*—
Wang, Chih-Chung, 4,227,928, Cl. 75-238.000.

Kennedy, James P. Multivariable control system for regulating process conditions and process optimizing. 4,228,509, Cl. 364-501.000.

Kerber, Dathan R.; Johnson, Orlin W.; Week, Robert D.; Benson, Richard E.; VandeWiele, John L.; and Lucas, James R., to International Harvester Company. Floating cutterbar header and height control. 4,227,363, Cl. 56-10.200.

Kerr, Allan J.; and Kibblewhite, Robert P. Method of treating lignocellulosic or cellulosic pulp to promote the kinking of pulp fibres and/or to improve paper tear strength. 4,227,964, Cl. 162-9.000.

Kerr-McGee Corporation: *See*—
Knebel, Alfred H.; and Rhodes, Donald E., 4,227,994, Cl. 208-177.000.

Keuchel, Herbert W.; and Farris, George A., to PNC Company. Process and apparatus for manufacturing a non-woven fabric and the product thereof. 4,227,957, Cl. 156-443.000.

Khemthong, Seksan: *See*—
Ling, Ku Sun; and Khemthong, Seksan, 4,227,940, Cl. 136-256.000.

Khorkhorina, Lidia P.: *See*—
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Kibblewhite, Robert P.: *See*—
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Kienzle Apparate GmbH: *See*—
Pfeifer, Heinrich, 4,228,519, Cl. 364-900.000.

Kienzle Uhrenfabriken GmbH: *See*—
Siefert, Roland, 4,228,533, Cl. 368-134.000.

Kienzle, Wolfgang: *See*—
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Kiguchi, Tasaburo; Hayashi, Kimiaki; and Yamaguchi, Isao, to Tanabe Seiyaku Co., Ltd. Novel phenethylamine derivatives and processes for preparing same. 4,228,183, Cl. 424-301.000.

Kii, Masami, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter having controlled rate of arc extinguishment. 4,228,333, Cl. 200-148.00R.

Kii, Masami: *See*—
Ibuki, Koji; Ueda, Yoshihiro; and Kii, Masami, 4,228,332, Cl. 200-148.00R.

Kim, Heung T., to B. F. Goodrich Company, The. Apparatus for working rubber compounds. 4,227,870, Cl. 425-208.000.

Kimura, Masaharu: *See*—
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,228,258, Cl. 525-390.000.

Kimura, Takeo: *See*—
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,227,799, Cl. 355-27.000.

Kimzey, Gene A.: *See*—
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Kindsfather, Gerald N. Tray assembly. 4,227,467, Cl. 108-101.000.

King, Edward: *See*—
King, William; and King, Edward, 4,227,661, Cl. 242-107.700.

King, Stephen J., to Nash Engineering Company, The. Production of phosphates. 4,228,140, Cl. 423-320.000.

King, William; and King, Edward. Latching mechanism and winding apparatus including same. 4,227,661, Cl. 242-107.700.

Kintron, Incorporated: *See*—
Keiser, Dennis L., 4,227,689, Cl. 272-130.000.

Kipling, Edward R., to Rayloc. Process for remanufacturing a master cylinder. 4,227,292, Cl. 29-402.040.

Kipping, Vernon L. Apparatus for pre-exposure of photographic film. 4,227,784, Cl. 352-244.000.

Kircher, Morton S.; and Specht, Steven J., to Olin Corporation. Means for connecting and disconnecting cells from circuit. 4,227,987, Cl. 204-228.000.

Kirchmeyr, Gustav, to TMC Corporation. Attachment for release ski bindings for cross-country skiing. 4,227,715, Cl. 280-618.000.

Kirker, Timothy J., to Rolls-Royce Limited. By-pass gas turbine engines. 4,227,370, Cl. 60-262.000.

Kirsch Company: *See*—
Ford, James A., 4,227,282, Cl. 16-93.00R.

Kisaichi, Akio: *See*—
Saito, Toshio; Oguchi, Masao; and Kisaichi, Akio, 4,227,882, Cl. 8-115.500.

Kish, Gerald J. Pneumatically operated gate for hopper bottoms for bulk handling equipment. 4,227,732, Cl. 294-71.000.

Kitagawa, Yoshihiko: *See*—
Kudo, Ken-ichi; Kitagawa, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,228,266, Cl. 526-283.000.

Kitayama, Minoru; and Odashima, Hisao, to Nippon Steel Corporation. Method for preventing decarburization of steel materials. 4,227,945, Cl. 148-6.000.

Kitzerow, Ernst R., to Berendsohn AG. Writing instrument. 4,227,823, Cl. 401-99.000.

Kiwala, Jacob: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,228,026, Cl. 252-174.110.

Kjaer, Ian; Schlunssen, Christoffer; Moller, Hans J.; and Mortensen, Niels E., to Skandinavisk Tobakskompagni A/S. Tobacco moistening method and apparatus. 4,227,539, Cl. 131-138.000.

Klas, Harold W.: *See*—
Park, Robert H.; Klas, Harold W.; and Estes, Nelson N., 4,227,476, Cl. 114-240.00A.

Klaus, Arthur; and Tacke, Horst, to Signode Corporation. Muffler for air-powered nailers and the like. 4,227,591, Cl. 181-230.000.

Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. N-Substituted α-ketocarboxylic acid amides. 4,228,082, Cl. 260-347.300.

Klein, Daniel: *See*—
Abbe, Robert C.; Poduje, Noel S.; and Klein, Daniel, 4,228,392, Cl. 324-61.00R.

Klein, Schanzlin & Becker AG: *See*—
Augsburger, Rolf; Kuppka, Horst; and Zilling, Helmut, 4,227,545, Cl. 137-340.000.

Klenk, Herbert: *See*—
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,228,082, Cl. 260-347.300.

Kline, Harry A.: *See*—
Williams, Alexander W.; and Kline, Harry A., 4,227,981, Cl. 204-180.00P.

Kling, Stephen C.; and Sands, William A. Safety wrapper and strap. 4,227,321, Cl. 36-91.000.

Klockner-Humboldt-Wedag AG: *See*—
Manshausen, Theodor; and Fritsch, Walter, 4,227,873, Cl. 432-131.000.

Klotzbach, Harry A. Ground preparing apparatus for no-till planting. 4,227,581, Cl. 172-142.000.

Kluger, Michael A., to Bendix Corporation, The. Backing plate-wheel cylinder retaining clip. 4,227,594, Cl. 188-361.000.

Knapp, Charles A.; and Boyd, Gary L., to Ford Motor Company. Drive system for a ceramic regenerator. 4,227,568, Cl. 165-8.000.

Knapp, Heinrich; and Jaggle, Gunther, to Robert Bosch GmbH. Fuel injection apparatus. 4,227,501, Cl. 123-453.000.

Knebel, Alfred H.; and Rhodes, Donald E., to Kerr-McGee Corporation. Operation of a coal deashing process. 4,227,994, Cl. 208-177.000.

Knotek, Otto; Lugscheider, Erich; and Wichert, Wolfgang, to Eutectic Corporation. Wear and corrosion resistant nickel-base alloy. 4,228,223, Cl. 428-558.000.

Knowles, Horace A., to Knowles, Horace A. Thumb twiddling toy. 4,227,342, Cl. 46-228.000.

Knox, Raymond L., to A-T-0 Inc. Battery charger. 4,228,390, Cl. 320-38.000.

Ko, Keiun: *See*—
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,228,258, Cl. 525-390.000.

Kobayashi, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyborodiphenylsiloxanes. 4,228,270, Cl. 528-8.000.

Kobayashi, Kazunobu: *See*—
Ohta, Shinichi; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,227,780, Cl. 351-7.000.

Kobayashi, Nobuyuki; Suematsu, Toshio; and Bitou, Minoru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronic control fuel injection system which compensates for fuel drying in an intake passage. 4,227,490, Cl. 123-492.000.

Kobe, Inc.: *See*—
Erickson, John W.; and Kelleher, John M., 4,227,865, Cl. 417-365.000.

Koda, Akihide: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Hachiya, Terumi; Ide, Hiroyuki; and Koda, Akihide, 4,228,304, Cl. 562-507.000.

Kodaira, Masaru: *See*—
Kakimoto, Kunihiko; and Kodaira, Masaru, 4,227,372, Cl. 60-602.000.

Kodama, Mikio: *See*—
Sakano, Hajime; Kodama, Mikio; Shoji, Toshihiro; and Yoshida, Isao, 4,228,051, Cl. 260-23.70R.

Kodama, Yutaka: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,228,440, Cl. 346-75.000.

Kofke, William A.: *See*—
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,023, Cl. 252-63.000.
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,024, Cl. 252-63.000.

Kohara, Hideo: *See*—
Yagi, Toshiro; Yamamoto, Junichi; and Kohara, Hideo, 4,228,203, Cl. 427-229.000.

Kohler Co.: *See*—
Greene, Norman D., 4,227,567, Cl. 165-1.000.

Kohler, Samuel H.: *See*—
Kanner, Gary L.; Kohler, Samuel H.; and Lewis, Robert E., 4,228,343, Cl. 219-225.000.

Kojima, Shozo: *See*—
Honda, Toshio; Fukuura, Yukio; Tanuma, Itsuo; Ishikawa, Hikaru; Ogawa, Masao; Kojima, Shozo; and Ueno, Kazunori, 4,227,956, Cl. 156-334.000.

Kokubu, Teruo, to Zebra Co., Ltd. Composite writing instrument. 4,227,822, Cl. 401-17.000.

Kolarik, Jan: *See*—
Hudecek, Slavko; Hnidek, Jaroslav; Heidingsfeld, Viktor; Kolarik, Jan; and Zelinger, Jiri, 4,228,205, Cl. 428-35.000.

Kolb, Heinz: *See*—
Ackermann, Rolf; Kolb, Heinz; Morlock, Gerhard; and Schreyer, Gerd, 4,228,084, Cl. 260-348.120.

Kollmorgen Technologies Corporation: *See*—
Arnold, Frank, Jr.; and Geiger, Dana F., 4,228,384, Cl. 318-254.000.

Komatsu, Akio: *See*—
Inose, Fumiyuki; Endo, Hirohide; and Komatsu, Akio, 4,228,329, Cl. 200-5.00A.

Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens barrel for flash photography. 4,227,791, Cl. 354-196.000.

Kondo, Mitsuru: *See*—
Iwasaki, Hiroshi; Okamoto, Shigeo; and Kondo, Mitsuru, 4,228,031, Cl. 252-316.000.

Kondo, Ryotaro: *See*—
Okita, Yuji; Kondo, Ryotaro; and Nii, Yoshiji, 4,228,476, Cl. 361-68.000.

Kondou, Takayasu: *See*—
Ando, Shigeo; and Kondou, Takayasu, 4,227,435, Cl. 84-1.190.

Konig, Peter, to Tioxide Group Limited. Method for the preparation of catalyst of vanadium pentoxide on substrate of titanium dioxide. 4,228,038, Cl. 252-461.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nezu, Takao, 4,227,800, Cl. 355-72.000.
Okonogi, Kyohei; Sato, Mikio; Mogaki, Katsuo; Sasaki, Takashi; and Uchida, Takashi, 4,228,235, Cl. 430-542.000.

Kono, Hisashi; Terai, Kenji; Niwa, Takazumi; Uemura, Katsumi; and Oda, Tetsuya, to Ube Industries Ltd. Process for the preparation of anhydrous magnesium chloride having a high degree of purity. 4,228,144, Cl. 423-498.000.

Konort, Mark D.: *See*—
Lamberti, Vincent; and Konort, Mark D., 4,228,027, Cl. 252-174.190.

Korbonits, Dezso: *See*—
Szebeni, Rudolf; Korbonits, Dezso; Harsanyi, Kalman; Molnar, Leventene; Szekeres, Laszlo; Papp, Gyula; and Sebestyen, Gyula, 4,228,164, Cl. 424-246.000.

Korcz, Eugene: *See*—
Vaillant, Christian; and Korcz, Eugene, 4,227,676, Cl. 254-277.000.

Kornyak, Petr P.: *See*—
Bauzhis, Albertas V.; Kornyak, Petr P.; Razhaitis, Vitautas K.; and Shneideris, Ioselis K., 4,228,414, Cl. 335-213.000.

Koshiba, Masao: *See*—
Yamamoto, Michihiro; Koshiba, Masao; and Aono, Shunji, 4,228,167, Cl. 424-251.000.

Koskivirta, Veikko, to Valmet Oy. Method and apparatus for loading or unloading water vessels. 4,227,846, Cl. 414-139.000.

Koster, Karl H.: *See*—
Gunther, Roland; and Koster, Karl H., 4,227,609, Cl. 198-711.000.

Koszi, Louis A.: *See*—
Hartman, Robert L.; Koszi, Louis A.; Mogab, Cyril J.; and Schwartz, Bertram, 4,227,975, Cl. 204-15.000.

Kothe, Dieter: *See*—
Rahmfeld, Werner; and Kothe, Dieter, 4,227,636, Cl. 226-189.000.

Kotzsch, Hans-Joachim; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of organoalkoxysilanes. 4,228,092, Cl. 556-422.000.

Kowalski, John L.: *See*—
Avalon, Max; Kowalski, John L.; and Tippetts, K. Boyd, 4,227,289, Cl. 29-33.00K.

Koyama, Masahiro: *See*—
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, 4,227,799, Cl. 355-27.000.

Koyama, Teruhisa: *See*—
Kudo, Ken-ichi; Kitagawa, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, 4,228,266, Cl. 526-283.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Beermann, Heinrich; and Lambrecht, Dietrich, 4,228,375, Cl. 310-214.000.

Kramer, William M., to RCA Corporation. Reduced blooming device having enhanced quantum efficiency. 4,228,446, Cl. 357-31.000.

Krass, Dennis K., to PPG Industries, Inc. Control of weeds with 1-(3-methyl-5-isothiazolyl)-3-alkoxyl-3-methylureas. 4,227,916, Cl. 71-90.000.

Kreiskorte, Heinz, to Thyssen Industrie AG. Press with small ram stroke. 4,227,450, Cl. 100-214.000.

Kreuzer, Helmut, to Robert Bosch GmbH. Rotor structure for dynamo electric machines subject to vibratory, shock, or temperature change effects. 4,228,377, Cl. 310-263.000.

Kriechbaum, Kurt; Kienhofer, Hans; and Picht, Rin J., to Zinser Textilmaschinen GmbH. Can changing device. 4,227,848, Cl. 414-395.000.

Krieg, John J., to Eaton Corporation. Hydraulic lash adjuster with oil reservoir separator. 4,227,495, Cl. 123-90.550.

Krishnan, Ramanathan: *See*—
Jouve, Hubert; Meyer, Robert; Sztern, Jacques; Krishnan, Ramanathan; Suran, Gabor; and Tessier, Michel, 4,227,947, Cl. 148-122.000.

Krone, Hartmut; van Acken, Rudiger; Trede, Wolfgang; and Schmidlin, Robert, to Buck Chemisch-Technische Werke GmbH & Co. Practice war head device. 4,227,460, Cl. 102-66.000.

Krull, Felix B., to NCR Corporation. Means for preventing drying of ink at nozzles of print heads. 4,228,442, Cl. 346-140.00R.

Kryzanowsky, Dmytro M. Musical instrument keyboard. 4,227,436, Cl. 84-423.00A.

Kubik, Hans, to Golde GmbH. Modular case section and frame section for lifting and/or sliding windows or doors. 4,227,346, Cl. 49-425.000.

Kuboki, Schigeo: *See*—
Iwamura, Masahiro; Hamada, Nagaharu; Kuboki, Schigeo; and Fukushima, Kenichi, 4,228,430, Cl. 340-709.000.

Kudo, Ken-ichi; Kitagawa, Yoshihiko; Koyama, Teruhisa; Takata, Akira; Kanagawa, Shuichi; and Yamaguchi, Tetsuo, to Sumitomo Chemical Company, Limited. Process for producing copolymerized resins. 4,228,266, Cl. 526-283.000.

Kudo, Yukitsuka: *See*—
Sato, Yasuhiko; Mizoguchi, Tomishige; Kudo, Yukitsuka; and Ishida, Ryuichi, 4,228,168, Cl. 424-256.000.

Kuehling, Guenter, to Bunker Ramo Corporation. Hand tool for terminal connection of electrical cable to an electrical connector. 4,227,299, Cl. 29-751.000.

Kuhle, Engelbert; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Combating fungi with novel N-sulphenylated carbamoyl compounds. 4,228,178, Cl. 424-274.000.

Kuiper, Jan, to Lever Brothers Company. Selective hydrogenation. 4,228,088, Cl. 260-409.000.

Kulka, Thomas S. Foot supporting strap for hospital bed. 4,227,271, Cl. 5-443.000.

Kuna, Wayne A.; and Terzian, Rouben T., to Marvin Glass & Associates. Graphic art toy. 4,227,335, Cl. 46-1.00R.

Kunath, Helfrid: *See*—
Bluhm, Karl H.; and Kunath, Helfrid, 4,227,532, Cl. 128-328.000.

Kuo, Chung-Ming; and Bogan, Richard T., to Eastman Kodak Company. Direct precipitation method for producing extrusion-grade cellulose acetate powder and resulting product. 4,228,276, Cl. 536-76.000.

Kupleian, Robert H., to American Cyanamid Company. Inhibiting plant bud growth with substituted 2,6-dinitroanilines. 4,227,913, Cl. 71-78.000.

Kuppka, Horst: *See*—
Augsburger, Rolf; Kuppka, Horst; and Zilling, Helmut, 4,227,545, Cl. 137-340.000.

Kuramoto, Akio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Semicircular plug for preventing leakage of oil in a cylinder head of an overhead cam shaft engine. 4,227,705, Cl. 277-160.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Asano, Kiro; Saito, Tsuyoshi; Hatanaka, Masayoshi; and Ikeda, Susumu, 4,228,275, Cl. 536-18.000.
Hino, Kuniaki; Uehara, Yasuo; Nishimura, Yasushi; Watanabe, Kazuhiro; and Okada, Yoshio, 4,228,037, Cl. 252-444.000.

Kurganov, Georgy I.: *See*—
Simin, Solomon K.; Kurganov, Georgy I.; Stark, Georgy N.; Kuzovkov, Jury S.; and Ludar, Arkady I., 4,227,657, Cl. 242-47.010.

Kurita, Yoshikazu: *See*—
Fujimoto, Ikuo; Isshiki, Setsuya; Kurita, Yoshikazu; and Sato, Yoji, 4,228,255, Cl. 525-288.000.

Kuzovkov, Jury S.: *See*—
Simin, Solomon K.; Kurganov, Georgy I.; Stark, Georgy N.; Kuzovkov, Jury S.; and Ludar, Arkady I., 4,227,657, Cl. 242-47.010.

Kyuleva, Nadejda A.: *See*—
Burov, Pencho V.; and Kyuleva, Nadejda A., 4,228,153, Cl. 424-95.000.

La Telemechanique Electrique: *See*—
Haury, Andre; and Marcenne, Jacques, 4,228,483, Cl. 361-393.000.

LaChapelle, Paul A.: *See*—
Benwood, Bruce R.; and LaChapelle, Paul A., 4,228,480, Cl. 361-235.000.

Lachmann, Burkhard; Rudolph, Hans; and Cohnen, Wolfgang, to Bayer Aktiengesellschaft. UV Light stabilized polycarbonate composition. 4,228,067, Cl. 260-45.85V.

LaConti, Anthony B.: *See*—
Dempsey, Russell M.; LaConti, Anthony B.; and Nolan, Mary E., 4,227,984, Cl. 204-195.00S.

Lacroix, Michel A. B.: *See*—
Guy, Bernard F. R.; and Lacroix, Michel A. B., 4,227,319, Cl. 35-12.00S.

LaFlame, Frank E., to General Motors Corporation. Cooling fan with viscous-magnetic fan clutch. 4,227,861, Cl. 416-169.00A.

Laky, Elmer, to Breeze Corporations, Inc. Cable tensioning device. 4,227,678, Cl. 254-391.000.

Lalumia, Thomas M.; and Fordemwalt, James N., to Burr Brown Research Corp. Bipolar integrated semiconductor structure including I^2L and linear type devices and fabrication methods therefor. 4,228,448, Cl. 357-46.000.

Lamadrid, Rene G., to Baxter Travenol Laboratories, Inc. Pressure coupling mechanism in a pressure monitoring assembly. 4,227,420, Cl. 73-756.000.

Lamadrid, Rene G.: *See*—
Soodak, Charles; Lamadrid, Rene G.; and Lohr, David, 4,227,814, Cl. 356-410.000.

Lambelin, Georges E.; Gillet, Claude L.; and Roba, Joseph L., to Continental Pharma. Alkyl and cycloalkylthiophenylalkylaminoalkanols, their salts and the preparation thereof. 4,228,187, Cl. 424-330.000.

Lambert, Thomas W.: *See*—
Stone, Barry N.; and Lambert, Thomas W., 4,228,465, Cl. 358-166.000.

Lamberti, Vincent; and Konort, Mark D., to Lever Brothers Company. Detergent compositions. 4,228,027, Cl. 252-174.190.

Lambrecht, Dietrich: *See*—
Beermann, Heinrich; and Lambrecht, Dietrich, 4,228,375, Cl. 310-214.000.

Landoll, Leo M., to Hercules Incorporated. Modified nonionic cellulose ethers. 4,228,277, Cl. 536-90.000.

Landry, Kossuth J., Jr. Soil erosion prevention blocks. 4,227,829, Cl. 405-20.000.

Lane, E. James: *See*—
Larson, Gerald L.; Lane, E. James; and Mueller, Robert S., 4,227,505, Cl. 123-198.00F.

Lang, Gerard; and Forestier, Serge, to L'Oreal. Cosmetic composition for imparting to human skin a coloration resembling a natural tan. 4,228,151, Cl. 424-60.000.

Lange, Harold T., to Spörlan Valve Company. Filter-drier for heat pump systems. 4,227,901, Cl. 55-301.000.

Lannert, Kent P., to Monsanto Company. Polycarboxylate ethers. 4,228,300, Cl. 560-180.000.

Laperche: *See*—
Rosell, Jean, 4,227,723, Cl. 292-34.000.

Larigaldie, Serge; and Cariou, Jean, to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Device for the production of a gaseous stream carrying electric charges. 4,228,479, Cl. 361-218.000.

La Rosa, John F., to International Paper Company. Self-inflating urinary catheter. 4,227,534, Cl. 128-349.00B.

Larson, Gerald L.; Lane, E. James; and Mueller, Robert S., to Eaton Corporation. Valve selector control system. 4,227,505, Cl. 123-198.00F.

Larson, Gerald L., to Litton Systems, Inc. Touch panel mechanism. 4,228,330, Cl. 200-5.00A.

Larsson, Finn H.; and Schwartzbach, Christian, to A/S Niro Atomizer. Gas distribution device for the supply of a processing gas to an atomizing chamber. 4,227,896, Cl. 55-260.000.

Laser Industries Ltd.: *See*—
Zandberg, Yoel, 4,228,341, Cl. 219-121.00L.

Laub, Bernard C., to Finnerty, Hugh J., a part interest. Mobile baseball equipment storage device. 4,227,710, Cl. 280-47.190.

Laucks, F. Michael; and Stegmann, Rudolph, to Frick Company. Single casing, multiple duty valve. 4,227,380, Cl. 62-217.000.

Laufer, Jay K.: *See*—
Pregitzer, Siegfried A.; Laufer, Jay K.; Marino, John J.; and Hancock, James W., 4,227,980, Cl. 204-159.230.

Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Shinya; and Arikawa, Junichi, 4,227,686, Cl. 271-95.000.

Lauzon, Rodrigue V.: *See*—
Hulyalkar, Ramchandra K.; and Lauzon, Rodrigue V., 4,228,058, Cl. 260-29.7UA.

Lavanchy, Gerard A.; Rossier, Marc-Henry; and Mezger, Fritz, to Maschinenfabrik & Eisengiesserei Ed. Mezger AG. Flow cut-off method and apparatus for foundry installations. 4,227,565, Cl. 164-155.000.

Law, Gabriel H.; and Gysegem, Albert P., to Ameron, Inc. Siloxane-tin coatings. 4,227,929, Cl. 106-1.170.

Lawhorne, Earl R., to American Cyanamid Company. Use of ion exchange resins in preparation of high solid TiO_2 slurries. 4,227,934, Cl. 106-300.000.

Laws, William R.; and Reed, Geoffrey R., to Encomech Engineering Services Ltd. Material separation. 4,227,922, Cl. 75-64.000.

Lazrus, Julian: *See*—
Bauer, Peter; and Lazrus, Julian, 4,227,550, Cl. 137-835.000.

Le Materiel Telephonique: *See*—
Guy, Bernard F. R.; and Lacroix, Michel A. B., 4,227,319, Cl. 35-12.00S.

Leah, George R.; and Pierce, Robert R., to Pennwalt Corporation. Single component potassium silicate cement for dry gunning. 4,227,932, Cl. 106-84.000.

Leban, Carl. Methods and means for reproducing non-alphabetic characters. 4,228,507, Cl. 364-419.000.

Lebault, Jean-Claude; and Rabouille, Guy, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Convertible seat for automobile vehicles. 4,227,736, Cl. 296-65.00R.

Lecinski, Frank H., Jr.; and Banich, John N., Sr., to Continental Group, Inc., The. Molded gasket press-on closure. 4,227,616, Cl. 215-246.000.

Lee, Cyril A., to E M I Limited. Security document and system. 4,228,348, Cl. 235-449.000.

Lee, Damong: *See*—
Chung, Tai H.; and Lee, Damong, 4,227,281, Cl. 16-29.000.

Lee, Gim F., Jr., to General Electric Company. Thermoplastic molding compositions of rubber modified copolymers of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride. 4,228,046, Cl. 260-5.000.

Lee, Henry L., Jr.; and Orlowski, Jan A., to Lee Pharmaceuticals. Rapid setting high bond strength adhesive. 4,228,062, Cl. 260-42.280.

Lee, Hua-Tung, to International Business Machines Corporation. Line-addressable serial-parallel-serial array. 4,228,526, Cl. 365-183.000.

Lee, Jiunn-Feng. Speed indicating apparatus for automobile. 4,227,416, Cl. 73-499.000.

Lee Pharmaceuticals: *See*—
Lee, Henry L., Jr.; and Orlowski, Jan A., 4,228,062, Cl. 260-42.280.

Lee, Walter; and Litt, Kenneth C., to Pace Incorporated. Container having threadable clip members and method of assembling same. 4,227,759, Cl. 312-257.00R.

Lee, Wooyoung: *See*—
Garwood, William E.; and Lee, Wooyoung, 4,227,992, Cl. 208-46.000.

Leen, Morris W.: *See*—
Sandrock, Harold E.; Leen, Morris W.; and Stark, Edward W., 4,227,810, Cl. 356-246.000.

Lefebvre, Benny M.: *See*—
Lefebvre, James K.; Lefebvre, Benny M.; and Lefebvre, Gilbert H., 4,227,691, Cl. 273-26.00R.

Lefebvre, Gilbert H.: *See*—
Lefebvre, James K.; Lefebvre, Benny M.; and Lefebvre, Gilbert H., 4,227,691, Cl. 273-26.00R.

Lefebvre, Inc.: *See*—
Lefebvre, James K.; Lefebvre, Benny M.; and Lefebvre, Gilbert H., 4,227,691, Cl. 273-26.00R.

Lefebvre, James K.; Lefebvre, Benny M.; and Lefebvre, Gilbert H., to Lefebvre, Inc. Batting tee. 4,227,691, Cl. 273-26.00R.

Le Goff, Yannick: *See*—
Senes, Michel; Le Goff, Yannick; Gourdier, Jean F.; and Quibel, Jacques, 4,228,039, Cl. 252-462.000.

Lehman, Richard F.: *See*—
Bobbe, Richard M.; Durbin, John A.; Lehman, Richard F.; and Seedhouse, Frederick A., 4,227,795, Cl. 355-3.00R.

Lehto, Ari; and Harjunmaa, Hannu. Method for detecting radiation. 4,228,354, Cl. 250-371.000.

Leithauser, Horst: *See*—
Rigler, Josef K.; Leithauser, Horst; Trukenbrod, Karl; and Ogrzewalla, Werner, 4,228,244, Cl. 521-56.000.

Lekander, Karl-Erik: *See*—
Ivnas, Lennart; and Lekander, Karl-Erik, 4,227,966, Cl. 162-36.000.

Lempke, Russell J.: *See*—
Hein, Carl C., III; Lempke, Russell J.; Silver, Harold K.; Spitz, Joseph J.; and Seidler, Don W., 4,228,215, Cl. 428-216.000.

Lenack, Alain L. P., to Exxon Research & Engineering Co. Chloro-sulphur additive. 4,228,021, Cl. 252-32.70R.

Le Nay, Tom W.; Hadden, Donald L.; and Beckwith, George S., to Baker Protective Services, Incorporated. Central station alarm. 4,228,424, Cl. 340-506.000.
Leonard, James D.; and Lewis, Michael J., to Conklin Company, Inc. Wetting agent and use thereof in agriculture. 4,227,911, Cl. 71-77.000.
Leonard, Willie B. Fluidic repeater. 4,227,440, Cl. 91-51.000.
Leone, Anthony J.; Leone, Raymond A.; and Long, James. Dockside protective device for boats. 4,227,832, Cl. 405-215.000.
Leone, Raymond A.: *See—*
Leone, Anthony J.; Leone, Raymond A.; and Long, James, 4,227,832, Cl. 405-215.000.
Lerman, Naum D.: *See—*
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Kuiper, Jan, 4,228,088, Cl. 260-409.000.
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van den Brom, Guido C., 4,228,043, Cl. 252-529.000.
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Lewis, Ronald H., 4,227,353, Cl. 52-15.000.
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Leonard, James D.; and Lewis, Michael J., 4,227,911, Cl. 71-77.000.
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Gawron, Louis, Jr.; Lindisch, Vincent H.; and Petrucci, John P., 4,228,328, Cl. 179-175.20R.
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Lipworth, Matthew F.: *See—*
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Litt, Kenneth C.: *See—*
Lee, Walter; and Litt, Kenneth C., 4,227,759, Cl. 312-257.00R.
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Liu, Chao Kai: *See—*
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Livesay, Richard E., to Caterpillar Tractor Co. Impact tip for impact rock breaker. 4,227,744, Cl. 299-94.000.
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Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.
Lobdell, Donn D.; and Herman, Stephen J., to Cobe Laboratories, Inc. Gas exchange apparatus. 4,228,125, Cl. 422-46.000.
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Holloway, Huland L.; and Norum, Edward M., Jr., 4,227,648, Cl. 239-11.000.
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., to Johns-Manville Corporation. Apparatus for applying tape material in continuously advancing sheet material. 4,227,960, Cl. 156-519.000.
Lohn, Gerd, to Kaltenbach & Voigt GmbH. Dental handpiece. 4,227,878, Cl. 433-80.000.
Lohr, David: *See—*
Soodak, Charles; Lamadrid, Rene G.; and Lohr, David, 4,227,814, Cl. 356-410.000.
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Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,228,295, Cl. 549-57.000.
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Long, James: *See—*
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Long, James H.: *See—*
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Long, William R.; and Long, James H., 4,227,538, Cl. 130-30.00C.
Long, William R.; and Long, James H., to Long Manufacturing N.C., Inc. Separator conveyor for peanut combine. 4,227,538, Cl. 130-30.00C.
Lopez, Manuel: *See—*
Bourassa, Joseph R.; and Lopez, Manuel, 4,227,671, Cl. 248-480.000.
Loqvist, Kaj-Ragnar; and Bennstedt, Leif-Ake, to Wave Energy Development I Vastmanland Aktiebolag. Apparatus for providing a surface coating on the wall in a cavity by means of electrolytic plating. 4,227,986, Cl. 204-209.000.
Lord, Ronald D., to Canadian Patents & Development Ltd. Safety helmet for miners. 4,227,520, Cl. 128-201.240.
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Kalopissis, Gregoire; Zysmann, Alexandre; Sebag, Henri; Vanlerberghe, Guy; Huron, Jean-Louis; and Bugaut, Andree, 4,228,259, Cl. 525-435.000.
Lang, Gerard; and Forestier, Serge, 4,228,151, Cl. 424-60.000.
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Losee, David L.; and Wilder, Alvin D., to Eastman Kodak Company. Silicon device with uniformly thick polysilicon. 4,228,452, Cl. 357-59.000.
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Loshaek, Samuel; and Shen, Chah M., to Wesley-Jessen Inc. Contact lenses of high gas permeability. 4,228,269, Cl. 526-346.000.
Louden, Samuel, to National Tube and Reel Corporation. Apparatus for applying an end cap to a cloth board reel. 4,227,958, Cl. 156-443.000.
Love, Phillip W. Apparatus for lifting and transporting large bales of material. 4,227,844, Cl. 414-24.500.
Lovely, John D., to GTE Products Corporation. Burst gating signal generating circuit. 4,228,456, Cl. 358-20.000.
Lowe, Warren; and Liston, Thomas V., to Chevron Research Company. Sulfurized alkylphenol-olefin reaction product lubricating oil additive. 4,228,022, Cl. 252-42.700.
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Hurt, Henry W., 4,227,578, Cl. 172-40.000.
Lucas Industries Limited: *See—*
Gaffney, Edward N., 4,227,864, Cl. 417-269.000.

Lucas, James R.: *See*—
Kerber, Dathan R.; Johnson, Orlin W.; Week, Robert D.; Benson, Richard E.; VandeWiele, John L.; and Lucas, James R., 4,227,363, Cl. 56-10.200.

Lucciola, Benjamin A. Aquatic swimming aid. 4,227,273, Cl. 9-307.000.

Luckenbill, Lawrence F., to Mueller Co. Fire hydrant with improved shoe and valve. 4,227,544, Cl. 137-307.000.

Ludar, Arkady I.: *See*—
Simin, Solomon K.; Kurganov, Georgy I.; Stark, Georgy N.; Kuzovkov, Jury S.; and Ludar, Arkady I., 4,227,657, Cl. 242-47.010.

Luft, Robert G., to International Harvester Company. Transmission disconnect with parking brake application. 4,227,598, Cl. 192-4.00A.

Lugscheider, Erich: *See*—
Knotek, Otto; Lugscheider, Erich; and Wichert, Wolfgang, 4,228,223, Cl. 428-558.000.

Lummus Company, The: *See*—
Sze, Morgan C.; and Schindler, Harvey D., 4,227,995, Cl. 208-251.00H.

Lundberg, Anders, to Stal Refrigeration AB. Bearing arrangement for shaft of rotary compressor. 4,227,755, Cl. 308-184.00R.

Lundquist, Ingemar H., to Valleylab. Intravenous administration set. 4,227,525, Cl. 128-214.00R.

Lunt, Robert S., III: *See*—
Keirns, Mary H.; and Lunt, Robert S., III, 4,227,398, Cl. 73-61.00R.

Luplow, William J.: *See*—
Hernandez, Pablo M.; and Luplow, William J., 4,227,972, Cl. 203-37.000.

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Luszczak, Myron M., to United States Gypsum Company. Production of hardboard. 4,227,965, Cl. 162-13.000.

Luther, Henry D., to R. F. Shouptronics Corp. Electronic voting machine. 4,227,643, Cl. 235-54.00F.

Luzzi, Louis A.; and Ma, Joseph K. H., to Research Corporation. Dimethyl isosorbide in liquid formulation of aspirin. 4,228,162, Cl. 424-232.000.

M.C.P. - Chemical Processes Ltd.: *See*—
Martan, Michael, 4,228,106, Cl. 570-197.000.

M. E. Cunningham, Company: *See*—
Speicher, Edwin W., 4,227,454, Cl. 101-93.010.

Ma, Joseph K. H.: *See*—
Luzzi, Louis A.; and Ma, Joseph K. H., 4,228,162, Cl. 424-232.000.

Mabie, Curtis P., to United States of America, Health, Education and Welfare. Additive composition for making dental materials. 4,227,937, Cl. 106-313.000.

Mabuchi Motor Co. Ltd.: *See*—
Mabuchi, Takaichi, 4,228,376, Cl. 310-242.000.

Mabuchi, Takaichi, to Mabuchi Motor Co. Ltd. Brush device. 4,228,376, Cl. 310-242.000.

MacAulay, Hugh G.: *See*—
Hurst, Eric J.; and MacAulay, Hugh G., 4,227,556, Cl. 141-137.000.

MacFarlane, John H. T., to Post Office, The. Hollow pole with internal wire gripping and securing means. 4,228,316, Cl. 174-45.00R.

Mackie, David R.: *See*—
Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.

Mac Laury, Michael R., to General Electric Company. Dehydrochlorination of a dihydroxydiphenyl trichloroethane. 4,228,308, Cl. 568-726.000.

MacLeay, Ronald E., to Pennwalt Corporation. Azoxy compound having use in a process for preparing foamed structures. 4,228,069, Cl. 260-143.000.

MacMillan, Melvin J., to Diamond Shamrock Corporation. Stabilization of vitamin A in presence of trace minerals. 4,228,159, Cl. 424-175.000.

MacMunn, George D.; and Brennan, Ward T., to Jervis B. Webb Company. Block control system for self-propelled vehicles. 4,227,666, Cl. 246-187.00C.

Madate, Haruhisa: *See*—
Ohta, Shinichi; Kobayashi, Kazunobu; and Madate, Haruhisa, 4,227,780, Cl. 351-7.000.

Maeda, Mitsuru: *See*—
Sugikawa, Susumu; Maeda, Mitsuru; and Tsujino, Takeshi, 4,228,141, Cl. 423-415.00A.

Maekawa, Iwao; Uchigasaki, Isao; and Monma, Noboru, to Hitachi Chemical Company, Ltd. Resin composition having low shrink properties. 4,228,251, Cl. 525-168.000.

Magata, Yoshihiro; Yoshida, Kobun; and Kato, Itsuo, to Pioneer Electronic Corporation. Interval detection and drive mechanism for cassette tape recorder. 4,228,472, Cl. 360-73.000.

Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,227,750, Cl. 308-3.800.

Magill, Jack M.: *See*—
Fogel, Maxwell S.; and Magill, Jack M., 4,227,876, Cl. 433-11.000.

Magnet, Melvin. Gasoline priming pump for carburetors. 4,228,110, Cl. 261-37.000.

Magnusson, Sven-Ake, to Wicanders GmbH. Bottle cap with ring shaped tearing element. 4,227,619, Cl. 215-255.000.

Maguire, Keith D.; and Currieo, Royce A., to Youngstown Sheet and Tube Company. Recovery of hydrocarbon vapors from air. 4,227,891, Cl. 55-85.000.

Mahaffey, Redge A.: *See*—
Ali, A. Wahab; Golden, Jeffry; Eden, J. Gary; Mahaffey, Redge A.; and Pasour, John A., 4,228,407, Cl. 331-94.50P.

Mailliet, Pierre: *See*—
Ulveling, Leon; Mailliet, Pierre; and Metz, Jean, 4,227,682, Cl. 266-271.000.

Maimur, Oieg K.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.

Maizner, Neil L.: *See*—
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Makino, Yoshimi: *See*—
Himuro, Masami; Yamada, Toshiro; and Makino, Yoshimi, 4,228,473, Cl. 360-114.000.

Makino, Yutaka, to Takeda Chemical Industries, Ltd. Method of removing phosphates from waste water. 4,228,003, Cl. 210-725.000.

Malavenda, Peter P. High volume method and system for dynamically storing articles for sorting and routing. 4,227,607, Cl. 198-460.000.

Maletzke, Jurgen: *See*—
Alsen, Klaus; Neidhardt, Hans; Maletzke, Jurgen; and Wimmer, Johann, 4,228,114, Cl. 264-33.000.

Malhotra, Sudarshan K.; and Van Heertum, John C., to Dow Chemical Company, The. Substituted pyridine methyl esters of 2-isopropyl-2-(4-chlorophenyl)acetic acid and their use as insecticides. 4,228,172, Cl. 424-263.000.

Malmros, Mark K.: *See*—
Hevey, Richard C.; and Malmros, Mark K., 4,228,237, Cl. 435-7.000.

Manaka, Nobuzi: *See*—
Takase, Sadao; Asano, Masaharu; and Manaka, Nobuzi, 4,227,507, Cl. 123-492.000.

Mandi, Attila: *See*—
Szejtli, Josef; Szente, Lajos; David, Agoston; Virag, Sandor; Sebestyen, Gyula; and Mandi, Attila, 4,228,160, Cl. 424-180.000.

Mannesmann Demag A.G. Wolfgang-Reuter-Platz: *See*—
Wiggershaus, Fred; and Schafer, Felix, 4,227,679, Cl. 254-270.000.

Manriquez, Ralph F., to International Computers Limited. Printer platen. 4,227,819, Cl. 400-56.000.

Manshausen, Theodor; and Fritsch, Walter, to Klockner-Humboldt-Wedag AG. Kiln with overlying beds. 4,227,873, Cl. 432-131.000.

Mantel, Nate, Jr.: *See*—
Raskin, Sidney; and Mantel, Nate, Jr., 4,227,278, Cl. 15-234.000.

Marcenne, Jacques: *See*—
Haury, Andre; and Marcenne, Jacques, 4,228,483, Cl. 361-393.000.

Marcus, Holger: *See*—
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,227,802, Cl. 356-5.000.

Margen, Peter H. E.; Roseen, Rutger A.; and Zinko, Heimo, to Aktiebolaget Atomenergi. Solar collector apparatus. 4,227,511, Cl. 126-415.000.

Marie, Gilbert, to Ato Chimie. Process for making alpha-olefin polymers or copolymers with high isotacticity index. 4,228,252, Cl. 525-247.000.

Marie, Gilbert, to Ato Chimie. Process for making alpha-olefin polymers or copolymers with high isotacticity index. 4,228,253, Cl. 525-247.000.

Marino, John J.: *See*—
Pregitzer, Siegfried A.; Laufer, Jay K.; Marino, John J.; and Hancock, James W., 4,227,980, Cl. 204-159.230.

Markevich, Mikhail A.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.

Marks, Richard L., to AMP Incorporated. Commoning connector. 4,227,763, Cl. 339-99.00R.

Marmon Company: *See*—
Bagus, Brian M., 4,227,432, Cl. 84-1.010.

Maroney, Peter F.: *See*—
Cox, Burton B.; and Maroney, Peter F., 4,227,481, Cl. 440-61.000.

Marriott, Eric W.: *See*—
Whittaker, Leonard B.; Clayton, William; Marriott, Eric W.; and Strong, Barry C., 4,227,385, Cl. 66-82.00R.

Marshall, Preston F., to Kendall Company, The. Method of making biaxially oriented nonwoven fabrics. 4,228,123, Cl. 264-557.000.

Marshall, Wilbur A. Drill sharpening gauge. 4,227,312, Cl. 33-201.000.

Martan, Michael, to M.C.P. - Chemical Processes Ltd. Process for producing beta-bromoethyl aromatic compounds. 4,228,106, Cl. 570-197.000.

Martel, Bernard, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Fuel supply devices for internal combustion engines. 4,227,496, Cl. 123-440.000.

Martin, Carl J.; Voelker, Marvin J.; and Ryan, Robert J., to RCA Corporation. Conductive molding composition. 4,228,050, Cl. 260-23.0XA.

Martin, David H.: *See*—
Barclay, Donald J.; Bird, Colin L.; Hallett, Michael H.; and Martin, David H., 4,228,431, Cl. 340-719.000.

Martin, Edward D. Portable stand apparatus for electric flood lights. 4,228,489, Cl. 362-250.000.

Martin, Henry, to Ciba-Geigy Corporation. Phenylglyoxylonitrile-2-oxime-cyanomethyl ether as a crop safener. 4,227,917, Cl. 71-100.000.

Martin Marietta Corporation: *See*—
Wells, Royzell F., 4,227,431, Cl. 82-76.000.

Martinchek, Gregory A.: *See*—
Bruckenstein, Stanley; and Martinchek, Gregory A., 4,228,400, Cl. 324-450.000.

Marulic, Walter J.: *See*—
Gutridge, Jack E.; and Marulic, Walter J., 4,227,465, Cl. 105-321.000.

Marvin Glass & Associates: *See*—
Kuna, Wayne A.; and Terzian, Rouben T., 4,227,335, Cl. 46-1.00R.

Marxer S.p.A.: *See*—
Giobbio, Vincenzo, 4,228,283, Cl. 544-355.000.

Maschinen und Werkzeugfabrik Kabel Vogel & Schemmann, Firma: *See*—
Jahn, Wolfgang, 4,227,351, Cl. 51-434.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See*—
Fischer, Hermann, 4,227,685, Cl. 271-13.000.

Maschinenfabrik & Eisengiesserei Ed. Mezger AG: *See*—
Lavanchy, Gerard A.; Rossier, Marc-Henry; and Mezger, Fritz, 4,227,565, Cl. 164-155.000.

Mason, Eric K. L.: *See*—
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Mason, Ronald F.; and Wood, Derek A., to Shell Oil Company. Separation of isomers. 4,228,081, Cl. 260-326.620.

Massachusetts Institute of Technology: *See*—
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Cook, Nathan H.; and Subramanian, Krishnamoorthy, 4,228,338, Cl. 219-76.130.

Massengeil, Hans A.; Bock, Georg; and Steinlehner, Fritz, to AGFA-Gevaert, A.G. Continuous copying machine. 4,227,803, Cl. 355-50.000.

Masters, William E. Supportive framework for a boat. 4,227,272, Cl. 9-6.00R.

Masu, Masanobu: *See*—
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, 4,228,258, Cl. 525-390.000.

Mathewson, James A.; and Pasterchick, Harry, Jr., to International Business Machines Corporation. Integral hinge structure. 4,227,283, Cl. 16-128.00R.

Mathieson, Roy W. Fuel metering and transfer control system. 4,227,497, Cl. 123-525.000.

Matiskella, John D.: *See*—
Montzka, Thomas A.; Matiskella, John D.; and Partyka, Richard A., 4,228,285, Cl. 546-63.000.

Matoba, Yoshiyuki; and Otsuka, Koichi, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Method of controlling a blast furnace operation. 4,227,921, Cl. 75-41.000.

Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, to Hitachi, Ltd. Rotor-stress preestimating turbine control system. 4,228,359, Cl. 290-40.00R.

Matsumoto, Hiroshi: *See*—
Ogata, Masaru; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Tawara, Katsuya, 4,228,165, Cl. 424-248.500.

Matsumoto, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Information display position-defining circuit for a cathode ray tube. 4,228,433, Cl. 340-748.000.

Matsumura, Jube: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Gamo, Takaharu; Moriwaki, Yoshio; Yamashita, Toshio; and Fukuda, Masataro, 4,228,145, Cl. 423-644.000.

Matsuya, Ryosuke, to Towa Dengyo Co., Ltd. Miniature electric light bulb sets for decorative illumination. 4,228,486, Cl. 362-237.000.

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Mattox, Darryl F. Waterborne sidewall air cushion vehicle. 4,227,475, Cl. 114-67.00A.

Matuura, Katuji, to Daiichikasei Co., Ltd. Method of treating glass fibers. 4,228,204, Cl. 427-372.200.

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Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A., 4,227,451, Cl. 100-295.000.

Mauser Kommandit-Gesellschaft: *See*—
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Maytag Company, The: *See*—
Bergeson, Richard P., 4,227,546, Cl. 137-387.000.

Mazanek, Jan: *See*—
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Mazgy, James D., to RCA Corporation. Logic circuit. 4,228,371, Cl. 307-317.00A.

MCA Discovision Inc.: *See*—
Dakin, Wayne R.; and Ceshkovsky, Ludwig, 4,228,326, Cl. 179-100.10G.

McAllister, LeRoy H., Jr. Impermeable membrane containing Trinidad Lake Asphalt and method of achieving same. 4,227,933, Cl. 106-281.00R.

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Bozler, Carl O.; Chapman, Ralph L.; Fan, John C. C.; and McClelland, Robert W., 4,227,941, Cl. 136-255.000.

McConnelee, Paul A.: *See*—
Brown, Dale M.; Chow, Tat-Sing P.; Gibbons, James F.; and McConnelee, Paul A., 4,227,944, Cl. 148-6.000.

McCoy, Lowell R.: *See*—
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McCulloch Corporation: *See*—
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McCurdy, Harold W., Jr.: *See*—
Weems, Sterling J.; and McCurdy, Harold W., Jr., 4,228,132, Cl. 422-174.000.

McElhaney, William G., to Anvil Corporation. Method and apparatus for punching openings in tubes. 4,227,393, Cl. 72-327.000.

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McElligott, Michael J.: *See*—
Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,227,720, Cl. 283-8.00R.

McEvoy, Dennis L.: *See*—
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McEwen, Gerald K.: *See*—
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McInnis, Andrew M., to DBS, Inc. Imprinting of time clock data. 4,227,453, Cl. 101-45.000.

McInnis, Donald E. Hanger and method for sound speakers. 4,227,669, Cl. 248-317.000.

McKechnie, John C., to United States of America, Navy. Surface elevation measuring apparatus. 4,227,401, Cl. 73-105.000.

McKinney, James C., to Ethyl Products Company. Fluid dispenser and nozzle structure. 4,227,650, Cl. 239-333.000.

McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., to Upjohn Company, The. Concrete preparation with aqueous solution of product from polyether with polymethylene polyphenyl polyisocyanate. 4,228,053, Cl. 260-29.2TN.

McLeod, Syble A. Panty liner construction. 4,227,531, Cl. 128-288.000.

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McNamara, Michael M.: *See*—
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McNelley, H. William, Jr., to American Associated Companies. Mop head. 4,227,277, Cl. 15-229.00R.

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Meadors, William R., to Peerless Machine & Tool Corporation. Method and apparatus for forming multiple thickness bead. 4,228,121, Cl. 264-291.000.

Means, John E., to Food Storage Systems, Inc. Atmosphere controlling method and apparatus for food storage. 4,228,197, Cl. 426-419.000.

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Wilcock, Donald F., 4,227,752, Cl. 308-9.000.
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Medina, Conrad R.; and Ramiro, Wifredo L., to Spotnails, Inc. Retractable clinching anvil stapler. 4,227,638, Cl. 227-155.000.

Meeder, Ernest P. Electrically conductive article and method of making the same. 4,228,194, Cl. 428-288.000.

Meier, Karl-Heinz: *See*—
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Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Track tensioning apparatus. 4,227,748, Cl. 305-10.000.

Meland, Bruce C.; Gindes, Bernard C., deceased; and by Gindes, Hanna, executrix. Apparatus for electrophysiological stimulation. 4,227,516, Cl. 128-1.00C.

Menke, Joseph T., to United States of America, Army. Magnesium anodize bath control. 4,227,976, Cl. 204-56.00M.

Meny, Allan H.; and Palmer, Dennis L. Absolute fluid filter. 4,227,899, Cl. 55-279.000.

Mercer, Robert R., to General Motors Corporation. Method of installing a ferrule. 4,227,294, Cl. 29-509.000.

Merchant, Stanley R.: *See*—
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Merck & Co., Inc.: *See*—
Ponpipom, Mitree M.; Bugianesi, Robert L.; Durette, Philippe L.; Katzen, Howard M.; and Shen, Tsung-Ying, 4,228,274, Cl. 536-4.000.

Shen, Tsung-Ying, 4,228,161, Cl. 424-232.000.
Merila, John B. Soda straw dispenser. 4,227,626, Cl. 221-188.000.
Merrell, Gregory L.: *See—*
Bernhard, Theodore L.; Dummermuth, Ernst; Hoch, Thomas M.; Jaffe, Bruce S.; and Merrell, Gregory L., 4,228,495, Cl. 364-101.000.
Merritt, James A., to United States of America, Army. Laser photochemical synthesis coating of optical fiber. 4,227,907, Cl. 65-3.00R.
Merry, Carl A., to Schaefer Marine, Inc. Mast collar system. 4,227,700, Cl. 277-12.000.
Meshulam, Avram, to CBS Inc. Utility knife with improved safety feature. 4,227,306, Cl. 30-342.000.
Metallwerk AG Buchs: *See—*
Bischof, Rudolf; Rhyner, Heinz; and Saxer, Kurt, 4,228,089, Cl. 260-428.500.
Metz, Jean: *See—*
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Meyer, Robert: *See—*
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Michelbrink, Bernhard: *See—*
Buchmuller, Horst; and Michelbrink, Bernhard, 4,227,468, Cl. 110-165.00R.
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Microalloying International, Inc.: *See—*
Subramanian, Sundaresa V.; Ghosh, Debabrata S.; Gray, John M.; Kay, David A. R.; and Purdy, Gary R., 4,227,924, Cl. 75-130.00R.
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Milburn, Zachariah H., Jr., to GTE Products Corporation. Bistable multivibrator with trigger steering. 4,228,370, Cl. 307-291.000.
Miller, Benjamin D., to Remcor Products Company. Control system for ice dispenser and method. 4,227,377, Cl. 62-66.000.
Miller, Clarence J., to Bradley Enterprises, Inc. Method of constructing a swimming pool. 4,227,361, Cl. 52-742.000.
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Milner, Nigel E.; and Payne, Christine C., to Eastman Kodak Company. Purification of photographic image-forming sulfonamido compounds employing immiscible solvents. 4,228,070, Cl. 260-152.000.
Milton Roy Company: *See—*
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Mims, Calvin. A quiz game with response indication for correct and incorrect answers. 4,227,318, Cl. 35-9.00B.
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Fitzer, Robert C., 4,227,350, Cl. 51-295.000.
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Misawa, Akira; and Numata, Tatsuo, to Pioneer Electronic Corporation. Digital tuning FM stereophonic receiver including phase locked loop synthesizer. 4,228,542, Cl. 455-174.000.
Misterka, Robert J. Miniature house construction. 4,227,336, Cl. 46-12.000.
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Mitsubishi Denki Kabushiki Kaisha: *See—*
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Miyajima, Ryuichi: *See—*
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Mobay Chemical Corporation: *See—*
Prasad, Vidyanatha A.; and Vines, James H., 4,228,279, Cl. 544-183.000.
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Moe, Walter; Diker, Charles M.; and Wolf, Harley, to Diker Moe Associates. Toy animal. 4,227,339, Cl. 46-123.000.
Moe, Walter; and Diker, Charles M., to Diker Moe Associates. Toy racing track. 4,227,693, Cl. 273-86.00C.
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Molloy, R. Michael; and Debono, Manuel, to Eli Lilly and Company. Iodo-A-23187 derivatives. 4,228,293, Cl. 548-216.000.
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Momany, Frank A., to Beckman Instruments, Inc. Synthetic peptides having pituitary growth hormone releasing activity. 4,228,155, Cl. 424-177.000.
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Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., to International Flavors & Fragrances Inc. 3-Hydroxy-1-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-1-butanone in detergents. 4,228,026, Cl. 252-174.110.

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Moore, Richard A.; Hartman, Robert J.; Levis, William W., Jr.; and Bloom, Ralph E., to BASF Wyandotte Corporation. Stabilized polyoxyalkylene polyether polyol. 4,228,247, Cl. 521-107.000.

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Morgan, John H., to Morgan Berkeley & Company Ltd. Anode assembly. 4,227,985, Cl. 204-196.000.

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Moshier, Stephen L., to Dialog Systems, Inc. Multibus processor for increasing execution speed using a pipeline effect. 4,228,498, Cl. 364-200.000.

Mossman, Michael W.; and Rohweder, Glen W., to Deere & Company. Gatherer sheet arrangement for a row crop harvesting header. 4,227,368, Cl. 56-106.000.

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Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Electrical connector for printed circuit boards. 4,227,767, Cl. 339-176.0MF.

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Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, to Burroughs Corporation. Protected document. 4,227,720, Cl. 283-8.00R.

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Murakami, Hideyo, to Nippon Telegraph & Telephone Public Corporation. Receiver device having a function for suppressing transient noises during abrupt interruptions. 4,228,545, Cl. 455-296.000.

Murakami, Takeshi; Nakamura, Teruo; and Yagi, Hisanori, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive record material. 4,228,222, Cl. 428-500.000.

Murakami, Tomomi, to Citizen Watch Company, Limited. Liquid crystal display cell. 4,227,777, Cl. 350-334.000.

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Murray, Dale L.; and Dohse, Jerry L., to Tonka Corporation. Toy building units. 4,227,337, Cl. 46-12.000.

Musha, Takanori; and Terutaka, Yao, to Nippon Zeon Co. Ltd. Process for polymerizing homogenized vinyl chloride emulsion which had been pre-dispersed. 4,228,268, Cl. 526-344.200.

Nagano, Humikazu; Sasaki, Hiromu; and Yasuda, Syoichi, to Sharp Kabushiki Kaisha. Output correcting system for facsimile. 4,228,468, Cl. 358-280.000.

Nakada, Akira: *See—*
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Nakamura, Teruo: *See—*
Murakami, Takeshi; Nakamura, Teruo; and Yagi, Hisanori, 4,228,222, Cl. 428-500.000.

Nakanishi, Atsuo: *See—*
Izawa, Shinichi; Sugiyama, Jun; and Nakanishi, Atsuo, 4,228,064, Cl. 260-45.70P.

Nakano, Masao: *See—*
Nishikawa, Yoshiyasu; Harada, Chosei; and Nakano, Masao, 4,227,868, Cl. 416-186.00R.

Nakano, Yoshiyuki: *See—*
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.

Nakayama, Kazuyoshi: *See—*
Oguni, Hiroshi; Ishiko, Masahiro; and Nakayama, Kazuyoshi, 4,227,442, Cl. 91-392.000.

Nalco Chemical Company: *See—*
Phillips, Kenneth G., 4,228,057, Cl. 260-29.6TA.

Napoli, Louis S., to RCA Corporation. Solar cell grid patterns. 4,228,315, Cl. 136-256.000.

Narayan, Thirumurti, to BASF Wyandotte Corporation. Process for the preparation of liquid carbodiimide-modified organic polyisocyanates employing organotin catalysts. 4,228,095, Cl. 260-453.0AM.

Nash, Donald H.: *See—*
Celli, John R.; and Nash, Donald H., 4,228,320, Cl. 179-2.0EA.

Nash Engineering Company, The: *See—*
King, Stephen J., 4,228,140, Cl. 423-320.000.

National Distillers and Chemical Corporation: *See—*
Pritchett, Ervin G., 4,228,250, Cl. 525-57.000.

National Instrument Company, Inc.: *See—*
Bennett, Richard N., 4,227,627, Cl. 222-282.000.

National Research Development Corporation: *See—*
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.

National Semiconductor Corporation: *See—*
George, Peter K., 4,228,522, Cl. 365-15.000.
Vennard, John, 4,228,389, Cl. 320-2.000.
Widlar, Robert J., 4,228,404, Cl. 330-267.000.

National Starch and Chemical Corporation: *See—*
Chiu, Chung W.; and Rutenberg, Morton W., 4,228,199, Cl. 426-578.000.

National Tube and Reel Corporation: *See—*
Louden, Samuel, 4,227,958, Cl. 156-443.000.

National Wire Products: *See—*
Schlenker, Robert W., 4,227,359, Cl. 52-713.000.

Naunas, Robert A., Jr.: *See—*
Andrew, Eduardo V.; Naunas, Robert A., Jr.; and Armstrong, Richard C., Jr., 4,227,862, Cl. 417-12.000.

Navarro, Pablo. Wave motion apparatus. 4,228,360, Cl. 290-43.000.

NCR Corporation: *See—*
Krull, Felix B., 4,228,442, Cl. 346-140.00R.

Neal, Charles M., Jr. Battle of the Alamo game. 4,227,695, Cl. 273-255.000.

Neal, Roy L., Jr. Adapter unit for translating electrical signals. 4,228,474, Cl. 360-137.000.

Neale, Ronald G.; and Wood, Grady M., to Harris Corporation. Multilevel sequence of erase pulses for amorphous memory devices. 4,228,524, Cl. 365-163.000.
Nechutny, Zdenek L. A. Z.: *See*—
Burge, Malcolm L. E.; and Nechutny, Zdenek L. A. Z., 4,228,198, Cl. 426-548.000.
Neidhardt, Hans: *See*—
Alsen, Klaus; Neidhardt, Hans; Maletzke, Jurgen; and Wimmer, Johann, 4,228,114, Cl. 264-33.000.
Neil, Clyde C.: *See*—
Phillips, William; Neil, Clyde C.; and Hammer, Jacob M., 4,227,769, Cl. 350-96.190.
Nelson Research & Development Company: *See*—
Eakins, Kenneth E.; and Allan, Geoffrey, 4,228,176, Cl. 424-273.00R.
Nepomnyaschy, Anatoly I.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.
Neri, Bruno, to Cir S.p.A. Divisione Sasib. Method for testing cigarettes. 4,227,397, Cl. 73-38.000.
Neue, Uwe D.: *See*—
Rausch, Carl W.; Tuvin, Yury; and Neue, Uwe D., 4,228,007, Cl. 210-198.00C.
Neumann, George J.; and Altschul, Barry, to Raytheon Company. Coaxial electrical connector. 4,227,765, Cl. 339-143.00R.
Neutrik Aktiengesellschaft: *See*—
Weingartner, Bernhard, 4,228,439, Cl. 346-33.00R.
Nevin, Robert L., to United States of America, Air Force. Radar sensitivity time control using range gated feedback. 4,228,435, Cl. 343-5.0SM.
New York Institute of Technology: *See*—
Glenn, William E., 4,227,417, Cl. 73-625.000.
Newall, Christopher E.: *See*—
Cherry, Peter C.; Newall, Christopher E.; and Watson, Nigel S., 4,228,074, Cl. 260-239.00A.
Newman, Jerry C. Hand tool for cutting blind strips and the like. 4,227,305, Cl. 30-229.000.
Newsom, Bobby G. Construction blocks. 4,227,357, Cl. 52-344.000.
Nezu, Takao, to Konishiroku Photo Industry Co., Ltd. Apparatus for loading cassette containing recording sheets. 4,227,800, Cl. 355-72.000.
Ng, Keng C.: *See*—
Weaver, Merle L.; and Ng, Keng C., 4,228,196, Cl. 426-407.000.
Nicholas, David C.: *See*—
Workman, Harold W.; and Nicholas, David C., 4,228,535, Cl. 370-16.000.
Nichols, John T.; and White, Horace S. Apparatus for filtering gas streams. 4,227,900, Cl. 55-288.000.
Niedermeyer, Karl O. Monitor apparatus for sump pumps. 4,228,427, Cl. 340-623.000.
Niedermeyer, Karl O. Visible signal for alarm, such as a smoke detector. 4,228,428, Cl. 340-628.000.
Nienow, John F.; Irving, Christopher L.; and Shaw, Lynwood V., to Philip Morris Incorporated. Measuring cigarette characteristics during pyrolysis smoking. 4,227,400, Cl. 73-81.000.
Nigrelli, Gus; and Baron, Bruce. Security covering box. 4,227,388, Cl. 70-427.000.
Nii, Yoshiji: *See*—
Okita, Yuji; Kondo, Ryotaro; and Nii, Yoshiji, 4,228,476, Cl. 361-68.000.
Nilsson, Tage: *See*—
Wallgren, Kurt; and Nilsson, Tage, 4,228,190, Cl. 426-421.000.
Nippon Cable System Inc.: *See*—
Okamura, Koshiro, 4,227,304, Cl. 30-169.000.
Nippon Chemiphar Company, Limited: *See*—
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Ando, Shigeo; and Kondou, Takayasu, 4,227,435, Cl. 84-1.190.
Chibana, Masanobu, 4,227,433, Cl. 84-1.010.
Ogita, Minoru, 4,228,540, Cl. 455-158.000.
Ogita, Minoru, 4,228,546, Cl. 455-302.000.
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,403, Cl. 328-15.000.
Nippon Kogaku K.K.: *See*—
Hasegawa, Hiroshi, 4,228,381, Cl. 315-151.000.
Nippon Steel Corporation: *See*—
Hosoi, Yuzo; Shinoda, Noboru; Tsuchida, Yutaka; Sekino, Shozo; Sakakihara, Mizuo; and Murota, Shoji, 4,227,925, Cl. 75-171.000.
Kitayama, Minoru; and Odashima, Hisao, 4,227,945, Cl. 148-6.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Kawarada, Kuniyasu; Suzuki, Masao; Ono, Chikai; and Toyoda, Kazuhiro, 4,228,525, Cl. 365-174.000.
Murakami, Hideyo, 4,228,545, Cl. 455-296.000.
Nippon Zeon Co. Ltd.: *See*—
Musha, Takanori; and Terutaka, Yao, 4,228,268, Cl. 526-344.200.
Ohishi, Tetsu; Handa, Kohichi; and Ueno, Haruo, 4,228,265, Cl. 526-230.000.
Nishikawa, Yoshiyasu; Harada, Chosei; and Nakano, Masao, to Kawasaki Jukogyo Kabushiki Kaisha. Single-curvature fan wheel of diagonal-flow fan. 4,227,868, Cl. 416-186.00R.
Nishimura, Akira: *See*—
Kashihara, Takanobu; Okuda, Fukuyasu; Yamaguchi, Masanaga; and Nishimura, Akira, 4,228,124, Cl. 422-36.000.
Nishimura, Yasushi: *See*—
Hino, Kuniaki; Uehara, Yasuo; Nishimura, Yasushi; Watanabe, Kazuhiro; and Okada, Yoshio, 4,228,037, Cl. 252-444.000.
Nissan Chemical Industries, Limited: *See*—
Yamamoto, Akira; Iida, Masaru; Miyake, Satoru; Yamaura, Hideo; and Inoue, Takeshi, 4,228,264, Cl. 526-200.000.
Nissan Motor Company, Limited: *See*—
Hamada, Mitsuharu, 4,227,595, Cl. 191-2.000.
Ideta, Yasufumi; and Watanabe, Shoei, 4,227,602, Cl. 192-109.00F.
Kakimoto, Kunihiko; and Kodaira, Masaru, 4,227,372, Cl. 60-602.000.
Sone, Masazumi; Suzuki, Kazuhiko; and Fukumori, Yukitsugu, 4,227,446, Cl. 98-2.110.
Takase, Sadao; Asano, Masaharu; and Manaka, Nobuzi, 4,227,507, Cl. 123-492.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Hiroo, 4,227,371, Cl. 60-547.00R.
Niwa, Takazumi: *See*—
Kono, Hisashi; Terai, Kenji; Niwa, Takazumi; Uemura, Katsumi; and Oda, Tetsuya, 4,228,144, Cl. 423-498.000.
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Hachiya, Terumi; Ide, Hiroyuki; and Koda, Akihide, to Hisamitsu Pharmaceutical Co. Inc. Novel cyclohexanecarboxylic acid and its derivatives. 4,228,304, Cl. 562-507.000.
Nolan, Daniel A., to Corning Glass Works. Monolithic optical waveguide having a plurality of cores. 4,227,771, Cl. 350-96.330.
Nolan, Mary E.: *See*—
Dempsey, Russell M.; LaConti, Anthony B.; and Nolan, Mary E., 4,227,984, Cl. 204-195.00S.
Noltes, Jan G.; Jastrzebski, J. T. B. H.; and van Koten, Gerard, to Borg-Warner Corporation. Hydrogenation process. 4,228,312, Cl. 585-250.000.
Nonaka, Kohei; Koyama, Masahiro; Gonmori, Makoto; Kimura, Takeo; and Shiga, Tetsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Image forming apparatus. 4,227,799, Cl. 355-27.000.
Nooner, Daryl W., to Texaco Inc. Reservoir stabilization by treating water sensitive clays. 4,227,575, Cl. 166-303.000.
Noordanus, Johannes: *See*—
De Jager, Johan B.; and Noordanus, Johannes, 4,228,319, Cl. 179-2.0EB.
Nordstrom, Lennart: *See*—
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, 4,227,802, Cl. 356-5.000.
Nordstrom, Sigurd A. M., to Saab-Scania Aktiebolag. Arrangement for attaching spring assemblies to vehicle axle housings. 4,227,716, Cl. 280-719.000.
Norris, Philip R., to Polaroid Corporation. Card motion picture projection system. 4,227,782, Cl. 352-82.000.
Norris, Philip R.: *See*—
Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., 4,227,789, Cl. 354-86.000.
Northrup, Lynn L., Jr.: *See*—
Blake, Floyd A.; and Northrup, Lynn L., Jr., 4,227,513, Cl. 126-425.000.
Northwestern University: *See*—
Jakstys, Milda M.; Tom, Baldwin H.; and Kahan, Barry D., 4,228,236, Cl. 435-1.000.
Norum, Edward M., Jr.: *See*—
Holloway, Hulan L.; and Norum, Edward M., Jr., 4,227,648, Cl. 239-11.000.
Nova Associates, Inc.: *See*—
Ryding, Geoffrey, 4,228,358, Cl. 250-457.000.
Nuese, Charles J.: *See*—
Ettenberg, Michael; and Nuese, Charles J., 4,228,349, Cl. 250-226.000.
Nugarus, Anthony R.: *See*—
Schindler, James; and Nugarus, Anthony R., 4,228,193, Cl. 426-233.000.
Nugent, John J., to Rolock, Inc. Temperature resistant, structurally stable member. 4,227,874, Cl. 432-261.000.
Numata, Tatsuo: *See*—
Misawa, Akira; and Numata, Tatsuo, 4,228,542, Cl. 455-174.000.
Nurnberger, George F.: *See*—
Haeberli, Joerg; Park, Kyong P.; Vellturo, Anthony F.; and Nurnberger, George F., 4,228,297, Cl. 560-75.000.
Nussbaum, Herbert, to Pharmainvent A.G. Apparatus for the metered supply of powder to a powder processing unit. 4,227,835, Cl. 406-52.000.
N.V. Koninklijke Pharmaceutische Fabrieken: *See*—
van der Stelt, Cornelis, 4,228,287, Cl. 546-236.000.
N.V. Optische Industrie "De Oude Delft": *See*—
Schoonmade, Bertus, 4,227,687, Cl. 271-139.000.
Nyu, Kiyosato: *See*—
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.
O & K Orenstein & Koppel Aktiengesellschaft: *See*—
Hofling, Peter, 4,227,605, Cl. 198-331.000.
Oakite Products, Inc.: *See*—
Williamson, Stanley C., 4,227,946, Cl. 148-6.160.

Occidental Oil Shale, Inc.: *See—*
Cha, Chang Y., 4,227,574, Cl. 166-259.000.
Oda, Tetsuya: *See—*
Kono, Hisashi; Terai, Kenji; Niwa, Takazumi; Uemura, Katsumi; and Oda, Tetsuya, 4,228,144, Cl. 423-498.000.
Odashima, Hisao: *See—*
Kitayama, Minoru; and Odashima, Hisao, 4,227,945, Cl. 148-6.000.
Oesterle, Gerhard, to Adolph Saurer Limited. Release device for the automatic rapid braking of moving machine parts, particularly of looms. 4,227,825, Cl. 403-322.000.
Offermanns, Heribert: *See—*
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,228,082, Cl. 260-347.300.
Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Larigaldie, Serge; and Cariou, Jean, 4,228,479, Cl. 361-218.000.
Ofusa, Masaatsu, to Yoshida Kogyo K.K. Woven slide fastener stringer. 4,227,555, Cl. 139-384.00B.
Ogata, Masaru; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Tawara, Katsuya, to Shionogi & Co., Ltd. Phenyl isothiocyanate derivatives and their production. 4,228,165, Cl. 424-248.500.
Ogawa, Masao: *See—*
Honda, Toshio; Fukuura, Yukio; Tanuma, Itsuo; Ishikawa, Hikaru; Ogawa, Masao; Kojima, Shozo; and Ueno, Kazunori, 4,227,956, Cl. 156-334.000.
Ogawa, Takenobu: *See—*
Yasuda, Nobuaki; Ogawa, Takenobu; and Sadamasa, Tetsuo, 4,228,455, Cl. 357-67.000.
Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. Radio receiver. 4,228,540, Cl. 455-158.000.
Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. AM Radio receiver. 4,228,546, Cl. 455-302.000.
Ogrzewalla, Werner: *See—*
Rigler, Josef K.; Leithauser, Horst; Trukenbrod, Karl; and Ogrzewalla, Werner, 4,228,244, Cl. 521-56.000.
Oguchi, Masao: *See—*
Saito, Toshio; Oguchi, Masao; and Kisaichi, Akio, 4,227,882, Cl. 8-115.500.
Oguni, Hiroshi; Ishiko, Masahiro; and Nakayama, Kazuyoshi, to Kawasaki Jukogyo Kabushiki Kaisha. Cylinder control device of hydraulic cylinder apparatus. 4,227,442, Cl. 91-392.000.
Ohishi, Tetsu; Handa, Kohichi; and Ueno, Haruo, to Nippon Zeon Co. Ltd. Process for producing sulfur-curable acrylic rubbers. 4,228,265, Cl. 526-230.000.
Ohm, Klaus, to Chemische Fabrik Dr. Wiedeking. Wire enamel. 4,228,059, Cl. 260-30.200.
Ohta, Shinichi; Kobayashi, Kazunobu; and Madate, Haruhisa, to Canon Kabushiki Kaisha. Eye examining instrument. 4,227,780, Cl. 351-7.000.
Okada, Yoshio: *See—*
Hino, Kuniaki; Uehara, Yasuo; Nishimura, Yasushi; Watanabe, Kazuhiro; and Okada, Yoshio, 4,228,037, Cl. 252-444.000.
Okamoto, Shigeo: *See—*
Iwasaki, Hiroshi; Okamoto, Shigeo; and Kondo, Mitsuru, 4,228,031, Cl. 252-316.000.
Okamura, Koshiro, to Nippon Cable System Inc. Device for removal of ice fixed to rod of control cable. 4,227,304, Cl. 30-169.000.
Okamura, Masatoshi; Shiba, Haruo; and Tanaka, Kimio, to TDK Electronics Company, Limited. Tape cassette. 4,227,622, Cl. 220-4.00B.
Okita, Yuji; Kondo, Ryotaro; and Nii, Yoshiji, to Tokyo Shibaura Denki Kabushiki Kaisha; and Tokyo Denryoki Kabushiki Kaisha, part interest to each. Protective relaying system. 4,228,476, Cl. 361-68.000.
Okonogi, Kyohei; Sato, Mikio; Mogaki, Katsuo; Sasaki, Takashi; and Uchida, Takashi, to Konishiroku Photo Industry Co., Ltd. Color photographic material. 4,228,235, Cl. 430-542.000.
Okuda, Fukuyasu: *See—*
Kashihara, Takanobu; Okuda, Fukuyasu; Yamaguchi, Masanaga; and Nishimura, Akira, 4,228,124, Cl. 422-36.000.
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Submultiple-related-frequency wave generator. 4,228,403, Cl. 328-15.000.
Okuni, Tetsuo; Ishihara, Masao; and Wada, Takeshi, to Hitachi, Ltd. Method of manufacturing stay ring for water turbine and pump turbine. 4,228,336, Cl. 219-73.100.
Okutsu, Eiichi; and Hayashi, Katsumi, to Fuji Photo Film Co., Ltd. Method for maintaining the development activity of a photographic lithographic developer constant. 4,228,234, Cl. 430-399.000.
Olin Corporation: *See—*
Belangee, Kenneth, 4,227,391, Cl. 72-54.000.
Gay, Walter A., 4,228,289, Cl. 548-128.000.
Kircher, Morton S.; and Specht, Steven J., 4,227,987, Cl. 204-228.000.
Rothgery, Eugene F., 4,228,290, Cl. 548-128.000.
Wood, Joseph L.; and Lipworth, Matthew F., 4,227,890, Cl. 55-30.000.
Olson, Donald F., to St. Charles Manufacturing Co. Bench structure with dust collector. 4,227,902, Cl. 55-302.000.
Olympus Optical Co., Ltd.: *See—*
Tojo, Tsutomu; and Uetake, Toshifumi, 4,227,773, Cl. 350-175.0ML.
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, to Toray Silicone Company, Ltd. Organopolysiloxane latex compositions. 4,228,054, Cl. 260-29.20M.
Ondetti, Miguel A.; and Weisenborn, Frank L., to E. R. Squibb & Sons, Inc. N-[2-(mercaptoalkyl)-3-mercaptoalkanoyl]-l-tryptophanes. 4,228,077, Cl. 260-326.14T.
Ondetti, Miguel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Carboxyalkylacylamino acids. 4,228,184, Cl. 424-309.000.
O'Neal, Thomas D., to American Cyanamid Company. Method for controlling the relative stem growth of plants. 4,227,912, Cl. 71-78.000.
Ono, Chikai: *See—*
Kawarada, Kuniyasu; Suzuki, Masao; Ono, Chikai; and Toyoda, Kazuhiro, 4,228,525, Cl. 365-174.000.
Onoda Cement Co., Ltd.: *See—*
Itoh, Tsutomu, 4,227,652, Cl. 239-706.000.
Uchikawa, Hiroshi; and Kato, Hajime, 4,227,931, Cl. 106-38.350.
Onopchenko, Anatoli: *See—*
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,023, Cl. 252-63.000.
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., 4,228,024, Cl. 252-63.000.
Oonishi, Toshiyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Cooling apparatus. 4,227,379, Cl. 62-198.000.
Opelika Manufacturing Corp.: *See—*
Brocklehurst, Charles E., 4,227,684, Cl. 270-67.000.
Optical Coating Laboratory, Inc.: *See—*
Ling, Ku Sun; and Khemthong, Seksan, 4,227,940, Cl. 136-256.000.
Orban, Robert A. Polarity correcting circuit. 4,228,368, Cl. 307-262.000.
O'Rell, Dennis D.; and Lin, Nan J., to W. R. Grace & Co. Battery separator. 4,228,225, Cl. 429-147.000.
Orlowski, Jan A.: *See—*
Lee, Henry L., Jr.; and Orlowski, Jan A., 4,228,062, Cl. 260-42.280.
Ortega, Edwin: *See—*
Gouzien, Michel J. Y.; and Ortega, Edwin, 4,227,859, Cl. 416-134.00A.
Ortel, Stanley G., to Better Wire Products, Inc. Tray stacking wire. 4,227,642, Cl. 229-52.0AW.
Orth, Winfried: *See—*
Pastorek, Emmerich; Orth, Winfried; and Fickert, Werner, 4,228,083, Cl. 260-347.800.
Osaka Gas Company, Limited: *See—*
Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, 4,228,033, Cl. 252-412.000.
Osborne, Scott R., to United States of America, Navy. Raster scan generator for plan view display. 4,228,432, Cl. 340-736.000.
Osman, Maged A., to BBC Brown Boveri & Company Limited. Liquid crystalline compositions. 4,228,029, Cl. 252-299.000.
Osswald, Gunter; and Gouders, Willy, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of readily dispersible pigment preparations. 4,227,936, Cl. 106-309.000.
Otawara, Yasuhiko: *See—*
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.
Otis Engineering Corporation: *See—*
Pearce, Joseph L.; Ray, Thomas W.; Taylor, Donald F.; and Yonker, John H., 4,227,573, Cl. 166-153.000.
Otsuka, Koichi: *See—*
Matoba, Yoshiyuki; and Otsuka, Koichi, 4,227,921, Cl. 75-41.000.
Otsuki, Juko S.: *See—*
Zorn, Milton J.; Slater, Edward L.; Maizner, Neil L.; Eccles, Brian J.; Minard, Hubert C.; Otsuki, Juko S.; and Sprengart, Daniel H., 4,227,786, Cl. 354-10.000.
Outboard Marine Corporation: *See—*
Hernandez, Pablo M.; and Luplow, William J., 4,227,972, Cl. 203-37.000.
Outokumpu Oy: *See—*
Lindroos, Leo E.; Turpeinen, Ahti E.; and Kapanen, Aarne A., 4,228,133, Cl. 422-195.000.
Overhead Conveyor Company: *See—*
Pochmara, Gary E., 4,228,388, Cl. 318-770.000.
Owen, Robert D.: *See—*
Dalley, Robert J.; Owen, Robert D.; and Parmenter, George S., 4,228,412, Cl. 335-152.000.
Owen, Whitney H., to United States of America, Energy. Induction machine. 4,228,391, Cl. 322-35.000.
Owens-Corning Fiberglas Corporation: *See—*
Rieser, Elmer P., 4,227,906, Cl. 65-2.000.
Owens-Illinois, Inc.: *See—*
Hornyak, Emery J., Jr.; Perry, Philip D.; and Sherman, James E., 4,227,909, Cl. 65-135.000.
Oxford Industries, Inc.: *See—*
Mitchell, William O.; Ellington, Gordon H.; and Hamilton, C. Ray, 4,227,470, Cl. 112-121.120.
Oxley, Alan J. Methods and means for storing energy. 4,227,374, Cl. 60-651.000.
Oya, Akiyoshi: *See—*
Okumura, Takatoshi; Nakada, Akira; Uchiyama, Yasuji; Aoki, Eiichiro; Yamaga, Eiichi; and Oya, Akiyoshi, 4,228,403, Cl. 328-15.000.
Oyama, Mitsuhiro: *See—*
Soeda, Katsuji; Oyama, Mitsuhiro; Sakuma, Fumio; and Nakajima, Tadashi, 4,228,383, Cl. 318-245.000.

Ozaki, Masaru: *See*—
Ona, Isao; Ozaki, Masaru; and Usui, Katsutoshi, 4,228,054, Cl. 260-29.20M.

P. J. Company: *See*—
Chung, Tai H.; and Lee, Damong, 4,227,281, Cl. 16-29.000.

Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., to Texaco Inc. Method and apparatus for measuring underground fluid flow characteristics. 4,228,350, Cl. 250-267.000.

Pace Incorporated: *See*—
Lee, Walter; and Litt, Kenneth C., 4,227,759, Cl. 312-257.00R.

Pall Corporation: *See*—
Pall, David B., 4,228,012, Cl. 210-238.000.

Pall, David B., to Pall Corporation. End cap coupler system for linking one filter cartridge to another filter cartridge or functional member. 4,228,012, Cl. 210-238.000.

Palmer, Dennis L.: *See*—
Meny, Allan H.; and Palmer, Dennis L., 4,227,899, Cl. 55-279.000.

Palombo, Gaston A.; and Jones, Daniel B., to Dataproducts Corporation. Electronic tachometer and combined brushless motor commutation and tachometer system. 4,228,396, Cl. 324-163.000.

Pang, Sing C.: *See*—
Genna, Sebastian; and Pang, Sing C., 4,228,515, Cl. 364-571.000.

Paoletti, Rodolfo: *See*—
Ferruti, Paolo; and Paoletti, Rodolfo, 4,228,152, Cl. 424-81.000.

Papay, Andrew G., to Edwin Cooper, Inc. Lubricating oil composition. 4,228,020, Cl. 252-29.000.

Paplaski, Joseph: *See*—
Vander Burgh, Lloyd A.; Moore, R. Dale; and Paplaski, Joseph, 4,227,670, Cl. 248-416.000.

Papp, Gyula: *See*—
Szebeni, Rudolf; Korbonits, Dezso; Harsanyi, Kalman; Molnar, Leventene; Szekeres, Laszlo; Papp, Gyula; and Sebestyen, Gyula, 4,228,164, Cl. 424-246.000.

Paradis, Roger: *See*—
Jones, Leslie; and Paradis, Roger, 4,227,621, Cl. 217-96.000.

Park, Kyong, to Kavlico Corporation. Capacitive pressure transducer. 4,227,419, Cl. 73-724.000.

Park, Kyong P.: *See*—
Haeberli, Joerg; Park, Kyong P.; Vellturo, Anthony F.; and Nurnberger, George F., 4,228,297, Cl. 560-75.000.

Park, Robert H.; Klas, Harold W.; and Estes, Nelson N., to United States of America, Navy. Detection streamer. 4,227,476, Cl. 114-240.00A.

Parker-Hannifin Corporation: *See*—
Bourassa, Joseph R.; and Lopez, Manuel, 4,227,671, Cl. 248-480.000.

Parmenter, George S.: *See*—
Dalley, Robert J.; Owen, Robert D.; and Parmenter, George S., 4,228,412, Cl. 335-152.000.

Parolini, Leo B.: *See*—
Colby, Richard A.; Parolini, Leo B.; and Butler, L. Dennis, 4,227,845, Cl. 414-39.000.

Parsons, Frederick L. Fluid dispensing pump having axially deformable valve. 4,227,628, Cl. 222-380.000.

Partenheimer, Walter, to Standard Oil Company (Indiana). Removal of nickel from cobalt and manganese. 4,228,091, Cl. 260-439.00R.

Partyka, Richard A.: *See*—
Montzka, Thomas A.; Matiskella, John D.; and Partyka, Richard A., 4,228,285, Cl. 546-63.000.

Pasour, John A.: *See*—
Ali, A. Wahab; Golden, Jeffry; Eden, J. Gary; Mahaffey, Redge A.; and Pasour, John A., 4,228,407, Cl. 331-94.50P.

Pasterchick, Harry, Jr.: *See*—
Mathewson, James A.; and Pasterchick, Harry, Jr., 4,227,283, Cl. 16-128.00R.

Pastir, Robert V.: *See*—
DiNicola, Nicola G.; Pastir, Robert V.; and Wright, William J., 4,228,481, Cl. 361-314.000.

Pastorek, Emmerich; Orth, Winfried; and Fickert, Werner, to Rutgerswerke Aktiengesellschaft. Process for the production of β-(5-nitro-2-furyl)-acrolein. 4,228,083, Cl. 260-347.800.

Patel, Ghanshyam C.: *See*—
Whitehill, Cassius F.; Whitehill, Robert D.; and Patel, Ghanshyam C., 4,227,867, Cl. 418-97.000.

Patel, Gordhanbhai N.; and Yee, Kwok C., to Allied Chemical Corporation. Diacetylene time-temperature indicators. 4,228,126, Cl. 422-56.000.

Paulus, Wilfried: *See*—
Genth, Hermann; Paulus, Wilfried; Schiller, Paul; Sattlegger, Hans; and Schnurrbusch, Karl, 4,228,065, Cl. 260-45.80N.

Payne, Christine C.: *See*—
Milner, Nigel E.; and Payne, Christine C., 4,228,070, Cl. 260-152.000.

Pcihoda, William W.: *See*—
Gursky, Michael T.; and Pcihoda, William W., 4,227,983, Cl. 430-323.000.

Peabody-Myers Corporation: *See*—
Shaddock, Roland E., 4,227,893, Cl. 55-97.000.
Shaddock, Roland E., 4,227,997, Cl. 209-250.000.

Peabody Process System, Inc.: *See*—
Johnson, Carlton A., 4,228,139, Cl. 423-242.000.

Pearce, Joseph L.; Ray, Thomas W.; Taylor, Donald F.; and Yonker, John H., to Otis Engineering Corporation. Reinforced seal unit for pumpdown pistons or well swabs. 4,227,573, Cl. 166-153.000.

Pearsall, Thomas P., to Thomson-CSF. (III) Plane gallium arsenide IMPATT diode. 4,228,453, Cl. 357-60.000.

Peelman, Harold E.: *See*—
Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., 4,228,350, Cl. 250-267.000.

Peerless Machine & Tool Corporation: *See*—
Meadors, William R., 4,228,121, Cl. 264-291.000.

Peignier, Michel; and Renault, Claude, to Rhone Poulenc Industries. Process and composition for cleaning or de-oiling textile materials. 4,227,883, Cl. 8-142.000.

Pekarskaya, Tatyana A.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.

Pekarsky, Viktor A.: *See*—
Enikolopov, Nikolai S.; Nepomnyaschy, Anatoly I.; Pekarsky, Viktor A.; Pekarskaya, Tatyana A.; Brusilovsky, Mikhail G.; Gavrilina, Svetlana A.; Lerman, Naum D.; Maimur, Oleg K.; Iljushin, Arkady L.; Markevich, Mikhail A.; Karpacheva, Susanna M.; Khorkhorina, Lidia P.; Muratov, Valeryan M.; and Sholk, Semen F., 4,228,271, Cl. 528-95.000.

Pendleton, Robert G.: *See*—
Bondinell, William E.; and Pendleton, Robert G., 4,228,170, Cl. 424-258.000.

Pennebaker, William B., to International Business Machines Corporation. Suspension arrangement for an oscillating body. 4,227,455, Cl. 101-93.050.

Pennwalt Corporation: *See*—
Cushman, Robert H., 4,228,356, Cl. 250-439.00P.
Leah, George R.; and Pierce, Robert R., 4,227,932, Cl. 106-84.000.
MacLeay, Ronald E., 4,228,069, Cl. 260-143.000.

Percebois, Alain A. P.: *See*—
Sutter, Jean G.; and Percebois, Alain A. P., 4,227,675, Cl. 251-173.000.

Perilstein, Warren L., to Ethyl Corporation. Compression ignition fuels for use in diesel engine having anti-wear properties. 4,227,889, Cl. 44-56.000.

Perkins, Frank A.: *See*—
Scharla-Nielsen, Hans; and Perkins, Frank A., 4,228,538, Cl. 455-9.000.

Perotto, Jean-Felix: *See*—
Fellrath, Jean; and Perotto, Jean-Felix, 4,228,534, Cl. 368-224.000.

Perry, James C., to United States of America, National Aeronautics and Space Administration. System for displaying at a remote station data generated at a central station and for powering the remote station from the central station. 4,228,422, Cl. 340-310.00A.

Perry, Philip D.: *See*—
Hornyak, Emery J., Jr.; Perry, Philip D.; and Sherman, James E., 4,227,909, Cl. 65-135.000.

Persson, Holger A.: *See*—
Gustavsson, Karl-Axel G.; and Persson, Holger A., 4,227,903, Cl. 55-302.000.

Peters, Ann M.: *See*—
Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.

Petersen, Otto; and Schmidt, Hans-Dieter, to Bayer Aktiengesellschaft. Electrochemical cell having a polarographic device with ion selective electrode as working electrode and method of use. 4,227,974, Cl. 204-1.00T.

Petrucci, John P.: *See*—
Gawron, Louis, Jr.; Lindisch, Vincent H.; and Petrucci, John P., 4,228,328, Cl. 179-175.20R.

Pettersson, Karl G.: *See*—
Alfthan, Bjorn J. V.; and Pettersson, Karl G., 4,227,608, Cl. 198-630.000.

Pettingell, Winslow L., to Foam Cutting Engineers, Inc. Method of densifying open-celled polyurethane material. 4,228,076, Cl. 264-321.000.

Pez, Guido, to Allied Chemical Corporation. Polymerization of acetylene. 4,228,060, Cl. 260-30.40R.

Pfeifer, Heinrich, to Kienzle Apparate GmbH. Monitoring method and system for a parking lot. 4,228,519, Cl. 364-900.000.

Pfister, Jurg R., to Syntex (U.S.A.) Inc. Antichlorinergic bronchodilators. 4,228,171, Cl. 424-263.000.

Pfizer Inc.: *See*—
Johnson, Michael R.; and Milne, George M., 4,228,169, Cl. 424-258.000.

Pfleger, Robert H., to Pflow Industries, Inc. Apparatus for removing and installing batteries. 4,227,463, Cl. 104-34.000.

Pflow Industries, Inc.: *See*—
Pfleger, Robert H., 4,227,463, Cl. 104-34.000.

Philip Morris Incorporated: *See*—
Nienow, John F.; Irving, Christopher L.; and Shaw, Lynwood V., 4,227,400, Cl. 73-81.000.

Phillips, Kenneth G., to Nalco Chemical Company. Grouting composition containing acrylate salts of iron. 4,228,057, Cl. 260-29.6TA.

Phillips Petroleum Company: *See*—
Bertus, Brent J.; and Walker, Darrell W., 4,228,040, Cl. 252-475.000.
Cheng, Paul J.; and Mills, King L., 4,228,143, Cl. 423-445.000.

Phillips, William; Neil, Clyde C.; and Hammer, Jacob M., to RCA Corporation. Planar optical waveguide comprising thin metal oxide film incorporating a relief phase grating. 4,227,769, Cl. 350-96.190.

Picht, Rin J.: *See*—
Kriechbaum, Kurt; Kienhofer, Hans; and Picht, Rin J., 4,227,848, Cl. 414-395.000.

Picker Corp.: *See*—
Gacki, Leonard W.; and Daly, Robert E., 4,227,818, Cl. 366-142.000.

Piedmont, James R.; and Hacskaylo, Michael, to United States of America, Army. Modular trim resistive network. 4,228,418, Cl. 338-195.000.

Piepenburg, Werner: *See*—
Anders, Wilfried; and Piepenburg, Werner, 4,227,300, Cl. 29-830.000.

Pierce, Robert R.: *See*—
Leah, George R.; and Pierce, Robert R., 4,227,932, Cl. 106-84.000.

Pilatowicz, Edward J., to McCulloch Corporation. Centrifugal clutch. 4,227,601, Cl. 192-105.0BA.

Pile, James E., to Brown & Williamson Tobacco Corporation. Moisture meter. 4,228,393, Cl. 324-61.00R.

Pindell, Roy K. Fishing line storage reel. 4,227,659, Cl. 242-84.10R.

Ping, Leu C. Punching press. 4,227,449, Cl. 100-98.00R.

Pioneer Electronic Corporation: *See*—
Magata, Yoshihiro; Yoshida, Kobun; and Kato, Itsuo, 4,228,472, Cl. 360-73.000.
Misawa, Akira; and Numata, Tatsuo, 4,228,542, Cl. 455-174.000.

Pippin, Wallace H.; and Daniels, Wiley E., to Air Products and Chemicals, Inc. Starch compatible polyvinyl acetate latices. 4,228,047, Cl. 260-17.4ST.

Pirlet, Robert A., to Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie. Method of determining a dimension of an article. 4,227,812, Cl. 356-372.000.

Pirlet, Robert A., to Centre de Recherches Metallurgiques Centrum voor Research in de Metallurgie. Process for determining a dimension of an object. 4,227,813, Cl. 356-372.000.

Pissiotas, Georg: *See*—
Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, 4,227,914, Cl. 71-88.000.

Pitkanen, Alan R. Reaction game apparatus. 4,227,690, Cl. 273-1.00R.

Pizzolato, Giacomo: *See*—
Confalone, Pasquale N.; Lollar, Elizabeth D.; Pizzolato, Giacomo; and Uskokovic, Milan R., 4,228,295, Cl. 549-57.000.

Plasmainvent AG: *See*—
Nussbaum, Herbert, 4,227,835, Cl. 406-52.000.

Plavsity, Louis, to Babcock & Wilcox Company, The. Tube crimping device. 4,227,395, Cl. 72-402.000.

Plaza, Mario G.; and Cushman, James E., to Durango Systems, Inc. Web drive mechanism for line/series printers. 4,227,821, Cl. 400-616.300.

Plester, Karl-Heinz; and Eggenstein, Friedrich, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,227,833, Cl. 405-299.000.

Plotkin, George M.: *See*—
Rhoads, Kevin G.; and Plotkin, George M., 4,228,405, Cl. 331-65.000.

Plueddemann, Edwin P., to Dow Corning Corporation. Method of producing improved vinyl chloride plastisol coating compositions. 4,228,061, Cl. 260-31.20R.

Plummer, Jan P., to Sound-Mate Inc. Device for remote control of stereo hi-fi amplifier parameters. 4,228,402, Cl. 179-1.0VL.

PNC Company: *See*—
Keuchel, Herbert W.; and Farris, George A., 4,227,957, Cl. 156-443.000.

Pochmara, Gary E., to Overhead Conveyor Company. Control circuit responsive to utility voltage level. 4,228,388, Cl. 318-770.000.

Poduje, Noel S.: *See*—
Abbe, Robert C.; Poduje, Noel S.; and Klein, Daniel, 4,228,392, Cl. 324-61.00R.

Poffenroth, Alfred E. Spray marking assembly. 4,227,649, Cl. 239-124.000.

Polaroid Corporation: *See*—
Bloom, Stanley M.; Borror, Alan L.; and Foley, James W., 4,228,075, Cl. 260-243.300.
Driscoll, John J.; Gold, Nicholas; Norris, Philip R.; and Wareham, Richard R., 4,227,789, Cl. 354-86.000.
Hardy, Herbert L., 4,227,781, Cl. 352-41.000.
Norris, Philip R., 4,227,782, Cl. 352-82.000.
Shenk, Edwin K., 4,227,790, Cl. 354-195.000.

Pollard, John H.: *See*—
Gutierrez, William A.; and Pollard, John H., 4,228,365, Cl. 307-221.00D.

Pond, Charles R.; and Texeira, Patrick D., to Boeing Company, The. Holographic angle sensor. 4,227,807, Cl. 356-152.000.

Ponpipom, Mitree M.; Bugianesi, Robert L.; Durette, Philippe L.; Katzen, Howard M.; and Shen, Tsung-Ying, to Merck & Co., Inc. 1-Substituted glycopyranosides. 4,228,274, Cl. 536-4.000.

Ponsford, Roger J.; and Howarth, Thomas T., to Beecham Group Limited. Clavulanic acid ethers. 4,228,174, Cl. 424-272.000.

Pont-A-Mousson S.A.: *See*—
Sutter, Jean G.; and Percebois, Alain A. P., 4,227,675, Cl. 251-173.000.

Poore, Donald L. Farrowing house. 4,227,485, Cl. 119-16.000.

Popelka, David A.: *See*—
Carlson, Floyd W.; Hester, Michael L.; and Popelka, David A., 4,227,665, Cl. 244-210.000.

Popov, Alexandr D.; and Solomin, Vladimir A. Linear induction motor. 4,228,372, Cl. 310-13.000.

Popowich, Michael J.: *See*—
Bouchard, Robert J.; Brixner, Lothar H.; and Popowich, Michael J., 4,228,482, Cl. 361-321.000.

Poppke, David. Automatic parking lot gate with four-way flex connector. 4,227,344, Cl. 49-9.000.

Porte, Pierre; and Togny, Jean, to Societe Civile d'Etudes et de Recherches pour L'Obtention de Fibres Minerales (S.E.R.O.F.I.M.). Three-dimensional shaped articles. 4,228,207, Cl. 428-80.000.

Post Office, The: *See*—
MacFarlane, John H. T., 4,228,316, Cl. 174-45.00R.

Powers, Kenneth W.; Roper, Robert; and Gorbaty, Martin L., to Exxon Research & Engineering Co. Functional group containing cyclic diolefin butyl rubbers. 4,228,254, Cl. 525-256.000.

PPG Industries, Inc.: *See*—
Humke, Byron M.; Gruber, Gerald W.; Dowbenko, Rostyslaw; and Friedlander, Charles B., 4,227,979, Cl. 204-159.160.
Krass, Dennis K., 4,227,916, Cl. 71-90.000.
Lewarchik, Ronald J.; Erikson, J. Alden; and Birkmeyer, William J., 4,228,294, Cl. 548-312.000.
Seymour, Samuel L., 4,227,908, Cl. 65-106.000.
Wallace, David R., 4,228,055, Cl. 260-29.300.

Pramstraller, Wilhelm, to Durst AG Fabrik Fototechnischer Apparate. Illuminating apparatus with a light control channel for photographic enlarging equipment with a rotatable picture stage in the plane of the negative to be copied. 4,227,804, Cl. 355-67.000.

Prange, Uwe: *See*—
El-Chahawi, Moustafa; and Prange, Uwe, 4,228,097, Cl. 260-465.00F.

Prasad, Vidyanatha A.; and Vines, James H., to Mobay Chemical Corporation. Production of O,O-dialkyl-S-(benzazimidomethyl)-thiolphosphoric acid esters. 4,228,279, Cl. 544-183.000.

Precision Monolithics, Inc.: *See*—
Brown, Paul M. Jr., 4,228,367, Cl. 307-251.000.

Precoul, Michel, to Societe d'Etudes, de Realisations et d'Applications Techniques. Weapon system, notably infantry anti-tank weapon. 4,227,438, Cl. 89-1.816.

Pregitzer, Siegfried A.; Laufer, Jay K.; Marino, John J.; and Hancock, James W., to Whittaker Corporation. Photoreactive coating compositions based on urethane modified acrylates. 4,227,980, Cl. 204-159.230.

Preston, Jack: *See*—
Hofferbert, William L., Jr.; and Preston, Jack, 4,227,885, Cl. 8-925.000.

Pretchtl, Alfred: *See*—
Burger, Manfred; Dukek, Waldeman; Gagel, Ernst; Pretchtl, Alfred; and Kalmovicz, Rudolf, 4,227,905, Cl. 62-113.000.

Preus, Paul. Inflatable barge. 4,227,477, Cl. 114-256.000.

Preus, Paul. Inflatable barge with compartmented interior. 4,227,478, Cl. 114-256.000.

Price, Ernest H. Well perforating apparatus and method. 4,227,582, Cl. 175-16.000.

Priegnitz, Ronald D., to Quaker Oats Company, The. Semi-moist pet food produce and process. 4,228,195, Cl. 426-321.000.

Priel, Ury; Gray, Jerry D.; and Frederick, Allen H., to Monolithic Memories, Inc. High resistivity semiconductor resistor device. 4,228,451, Cl. 357-51.000.

Primm, Gertrude B., executrix: *See*—
Primm, Richard W., deceased, 4,227,884, Cl. 8-155.100.

Primm, Richard W., deceased (by Primm, Gertrude B., executrix). Method of handling yarn. 4,227,884, Cl. 8-155.100.

Prine, Eugene D.: *See*—
Sullivan, John J.; and Prine, Eugene D., 4,227,381, Cl. 62-223.000.

Pritchett, Ervin G., to National Distillers and Chemical Corporation. Blends of hydrolyzed ethylene-vinyl acetate resins having increased impact strength. 4,228,250, Cl. 525-57.000.

Prochazka, Kamil; and Suter, Franz, to BBC Brown Boveri & Company Limited. Hydraulic servo-motor for a regulating valve having a hydraulic closing mechanism. 4,227,441, Cl. 91-374.000.

Procter & Gamble Company, The: *See*—
Cambre, Cushman M., 4,228,044, Cl. 252-547.000.
Clark, Clarence O.; Flautt, Thomas J., Jr.; and Speckman, Donald T., 4,228,334, Cl. 219-10.55E.
Jacobsen, Ronald L., 4,228,025, Cl. 252-99.000.
Letton, James C., 4,228,042, Cl. 252-528.000.

Procyk, Frank J.: *See*—
Cenker, Ronald P.; and Procyk, Frank J., 4,228,528, Cl. 365-200.000.

Prontor-Werk Alfred Gauthier GmbH: *See*—
Rentschler, Waldemar, 4,227,792, Cl. 354-230.000.

Provalsky, Gennady B.: *See*—
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A., 4,227,451, Cl. 100-295.000.

Proynoff, John D. Ion generator or electrostatic environmental conditioner. 4,227,894, Cl. 55-126.000.

Pryor, Robert A.: *See*—
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,227,298, Cl. 29-837.000.

Pucher, Richard A., to Sperry Corporation. Corn header drive system. 4,227,366, Cl. 56-14.200.

Pullman Incorporated: *See*—
Gutridge, Jack E.; and Marulic, Walter J., 4,227,465, Cl. 105-321.000.

McNally, George S.; and Snyder, Richard C., 4,227,354, Cl. 52-56.000.

Purdy, Gary R.: *See*—
Subramanian, Sundaresa V.; Ghosh, Debabrata S.; Gray, John M.; Kay, David A. R.; and Purdy, Gary R., 4,227,924, Cl. 75-130.00R.

Quaker Oats Company, The: *See*—
Priegnitz, Ronald D., 4,228,195, Cl. 426-321.000.

Quibel, Jacques: *See*—
Senes, Michel; Le Goff, Yannick; Gourdier, Jean F.; and Quibel, Jacques, 4,228,039, Cl. 252-462.000.

Quick-Rotan Becker & Notz KG: *See*—
Angersbach, Wolfgang; and Meier, Karl-Heinz, 4,228,385, Cl. 318-614.000.

Quigg, Thomas O.; and Delegard, Robert E., to Twin Harbor Dredging Co. Hydraulic dredge suction diversion flap. 4,227,323, Cl. 37-58.000.

R. F. Shouptronics Corp.: *See*—
Luther, Henry D., 4,227,643, Cl. 235-54.00F.

R & Z Vermogensverwaltungsgesellschaft mbH: *See*—
Wilhelm, Gunter R., 4,228,068, Cl. 260-112.00R.

Rabouille, Guy: *See*—
Lebault, Jean-Claude; and Rabouille, Guy, 4,227,736, Cl. 296-65.00R.

Rahamin, Raphael; and Cabelli, Gabriel. Electronic reminder system. 4,228,470, Cl. 360-12.000.

Rahmfeld, Werner; and Kothe, Dieter, to Demag A.G. Supporting roller stand for steel slab strand casting plants, particularly for curved slab strand casting plants. 4,227,636, Cl. 226-189.000.

Rainville Company, Inc.: *See*—
Rainville, Dewey; and Wunderlich, Ernst D., 4,227,871, Cl. 425-533.000.

Rainville, Dewey; and Wunderlich, Ernst D., to Rainville Company, Inc. Location of equipment on blow molding machines. 4,227,871, Cl. 425-533.000.

Rainwater, Dennis A.: *See*—
Detweiler, Charles A.; and Rainwater, Dennis A., 4,227,445, Cl. 92-84.000.

Ramiro, Wifredo L.: *See*—
Medina, Conrad R.; and Ramiro, Wifredo L., 4,227,638, Cl. 227-155.000.

Ramsey, Harley L.; and Ramsey, Harley M. Portable container carrying rack for bed-type delivery vehicle. 4,227,634, Cl. 224-42.45R.

Ramsey, Harley M.: *See*—
Ramsey, Harley L.; and Ramsey, Harley M., 4,227,634, Cl. 224-42.45R.

Ramsey, Vernon B.; and Woods, Donald E., to Teledyne Inc. Refurbishable aerial cargo delivery system and solid state circuit therefor. 4,227,663, Cl. 244-149.000.

Raskin, Sidney; and Mantel, Nate, Jr., to H. K. Specialty Co., Inc. Feather duster. 4,227,278, Cl. 15-234.000.

Rasmussen, Harry R.; and Kimzey, Gene A., to Crest Industries, Inc. Key telephone system having interstation signalling during hold condition. 4,228,324, Cl. 179-99.00H.

Rausch, Carl W.; Tuvin, Yury; and Neue, Uwe D., to Waters Associates, Inc. Chromatographic cartridge and holder. 4,228,007, Cl. 210-198.00C.

Ray, Thomas W.: *See*—
Pearce, Joseph L.; Ray, Thomas W.; Taylor, Donald F.; and Yonker, John H., 4,227,573, Cl. 166-153.000.

Rayloc: *See*—
Kipling, Edward R., 4,227,292, Cl. 29-402.040.

Raymond International Builders, Inc.: *See*—
Evans, Darrell L., 4,227,831, Cl. 405-196.000.

Raynes, Edward P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Liquid crystal material mixtures and devices incorporating such mixtures. 4,227,778, Cl. 350-350.00R.

Raytheon Company: *See*—
Neumann, George J.; and Altschul, Barry, 4,227,765, Cl. 339-143.00R.
Williamson, James; and Crete, Paul G., 4,228,434, Cl. 343-5.0AF.

Razhaitis, Vitautas K.: *See*—
Bauzhis, Albertas V.; Kornyak, Petr P.; Razhaitis, Vitautas K.; and Shneideris, Ioselis K., 4,228,414, Cl. 335-213.000.

RCA Corporation: *See*—
Abramovich, Abe, 4,227,411, Cl. 73-336.500.
Campbell, Francis J.; and Barkow, William H., 4,228,413, Cl. 335-213.000.
Demers, Robert R., 4,227,348, Cl. 51-283.00R.
Ettenberg, Michael; and Nuese, Charles J., 4,228,349, Cl. 250-226.000.
Kramer, William M., 4,228,446, Cl. 357-31.000.
Martin, Carl J.; Voelker, Marvin J.; and Ryan, Robert J., 4,228,050, Cl. 260-23.0XA.
Mazgy, James D., 4,228,371, Cl. 307-317.00A.
Napoli, Louis S., 4,228,315, Cl. 136-256.000.
Phillips, William; Neil, Clyde C.; and Hammer, Jacob M., 4,227,769, Cl. 350-96.190.
Steckler, Steven A.; and Balaban, Alvin R., 4,228,463, Cl. 358-158.000.
Takahashi, Tatsuo; and Yamada, Osamu, 4,228,454, Cl. 357-61.000.
Torrington, Leslie A., 4,227,699, Cl. 274-13.00R.

Redcom Laboratories, Inc.: *See*—
Gueldenpfennig, Klaus; and Breidenstein, Charles J., 4,228,536, Cl. 370-66.000.

Reed, Geoffrey R.: *See*—
Laws, William R.; and Reed, Geoffrey R., 4,227,922, Cl. 75-64.000.

Reed, John W.: *See*—
Lewis, David O.; and Reed, John W., 4,228,504, Cl. 364-200.000.

Reed, Robert D., to John Zink Company. Apparatus for recovery of flared condensible vapors. 4,227,897, Cl. 55-269.000.

Reed, Robert D.: *See*—
Zink, John S.; and Reed, Robert D., 4,227,872, Cl. 431-90.000.

Reedy, Wayne R.; and Russ, Edward F., to Carrier Corporation. Variable size coupling. 4,227,721, Cl. 285-18.000.

Regamey, Pierre E. Method and device for feeding a system for generating and distributing vapor condensable into make-up liquid. 4,227,489, Cl. 122-457.000.

Reichelt, Klaus: *See*—
Jakszt, Werner; Reichelt, Klaus; and Schiele, Gert, 4,228,478, Cl. 361-128.000.

Reimann, Hans, to Linde Aktiengesellschaft. Waste disposal treatment of calcium-containing organically loaded wastewaters. 4,227,998, Cl. 210-609.000.

Remcor Products Company: *See*—
Miller, Benjamin D., 4,227,377, Cl. 62-66.000.

Renault, Claude: *See*—
Peignier, Michel; and Renault, Claude, 4,227,883, Cl. 8-142.000.

Renner, Carl A., to Du Pont de Nemours, E. I., and Company. Process for preparing a methyl-substituted benzaldehyde. 4,228,302, Cl. 562-408.000.

Renner, Gerard: *See*—
Guscott, John K.; Renner, Gerard; and Wendt, Roger, 4,228,379, Cl. 310-322.000.

Rentschler, Waldemar, to Prontor-Werk Alfred Gauthier GmbH. Device for setting exposure time and aperture size on cameras. 4,227,792, Cl. 354-230.000.

Research Corporation: *See*—
Bruckenstein, Stanley; and Martinchek, Gregory A., 4,228,400, Cl. 324-450.000.
Luzzi, Louis A.; and Ma, Joseph K. H., 4,228,162, Cl. 424-232.000.
Wong, John L., 4,228,078, Cl. 260-326.320.

Respess, Herman M.: *See*—
Talansky, Alan R.; Respess, Herman M.; and Borst, William A., 4,227,308, Cl. 33-169.00B.

Restaurant Technology, Inc.: *See*—
Schindler, James; and Nugarus, Anthony R., 4,228,193, Cl. 426-233.000.

Reyenga, Gerald J.; and Wilkie, Arnold E., to Monsanto Company. Melt spinning process for producing nylon 66 yarns. 4,228,117, Cl. 264-176.00F.

Reyes, Peter A., to Textron, Inc. Composite flexural yoke for helicopters. 4,227,857, Cl. 416-134.00A.

Reymore, Harold E., Jr.: *See*—
McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., 4,228,053, Cl. 260-29.2TN.

Reynolds, Elizabeth H.: *See*—
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., 4,228,036, Cl. 252-437.000.

Reynolds Metals Company: *See*—
Howell, Alexander G., Jr.; and Settle, Evan E., III, 4,227,970, Cl. 202-234.000.

Rheem Manufacturing Company: *See*—
Ernst, Donald J., 4,227,668, Cl. 248-317.000.

Rhine, Samuel, to Helena Laboratories Corporation. Printer head biasing apparatus. 4,228,441, Cl. 346-139.00C.

Rhoads, Kevin G.; and Plotkin, George M., to VRL Growth Associates, Incorporated. Load activated normally quiescent waveform generator. 4,228,405, Cl. 331-65.000.

Rhodes, Donald E.: *See*—
Knebel, Alfred H.; and Rhodes, Donald E., 4,227,994, Cl. 208-177.000.

Rhone Poulenc Industries: *See*—
Peignier, Michel; and Renault, Claude, 4,227,883, Cl. 8-142.000.

Rhyner, Heinz: *See*—
Bischof, Rudolf; Rhyner, Heinz; and Saxer, Kurt, 4,228,089, Cl. 260-428.500.

Riat, Henri; and Seitz, Karl, to Ciba-Geigy Corporation. Triazine containing fiber-reactive disazo dyestuffs. 4,228,071, Cl. 260-153.000.

Ribaudo, Roland G.: *See*—
Morgan, Albert W.; and Ribaudo, Roland G., 4,228,245, Cl. 521-75.000.

Richard Heinze GmbH & Co. KG, Firma: *See*—
Zernig, Ernst, 4,227,284, Cl. 16-129.000.

Richardson, Richard N. Piggy back ski. 4,227,274, Cl. 9-310.00R.

Richter, Albert P., Jr.: *See*—
Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., 4,228,350, Cl. 250-267.000.

Richter, Reinhard H.: *See*—
McLaughlin, Alexander; Richter, Reinhard H.; and Reymore, Harold E., Jr., 4,228,053, Cl. 260-29.2TN.

Ricoh Company, Ltd.: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,228,440, Cl. 346-75.000.
Sakano, Yukio, 4,227,644, Cl. 235-433.000.
Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, 4,228,429, Cl. 340-632.000.

Riede, Willem: *See*—
Wouda, Kornelis J.; Giacometti, Alberto M.; and Riede, Willem, 4,228,409, Cl. 333-28.00R.

Riedel, Tilo, to Etablissements Francois Salomon et Fils. Automatic ski brake using stirrup-shaped spring wire. 4,227,714, Cl. 280-605.000.

Rieser, Elmer P., to Owens-Corning Fiberglas Corporation. Environmental control for mineral fiber-forming. 4,227,906, Cl. 65-2.000.

Rigler, Josef K.; Leithauser, Horst; Trukenbrod, Karl; and Ogrzewalla, Werner, to Chemische Werke Huls AG. Process for preparing fine particle expandable styrene polymers containing small concentrations of organic bromine compounds. 4,228,244, Cl. 521-56.000.

Riley, Harry J., to S. W. Hart & Co. Pty Ltd. Means for protecting solar water heating equipment against frost damage. 4,227,512, Cl. 126-420.000.

Ringe, Werner; and David, Harry, to Hauni-Werke Korber & Co. KG. Safe for storage of paper money and other valuables. 4,227,757, Cl. 312-97.000.

Ripley, John A.; Woods, Donald C.; and Kaine, James, to Del Mar Avionics. Charter with automatic editing. 4,228,506, Cl. 364-415.000.

Ritter, Ernst, to Robert Bosch GmbH. Limitation apparatus for full-load injection quantity in a supercharged internal combustion engine with fuel injection. 4,227,504, Cl. 123-380.000.

Rivera, Rafael R. Combined baby pillow case and bottle holder. 4,227,270, Cl. 5-436.000.

Rizzo, Frank E.; Miller, Marvin L.; and Weldon, Clark, to Harco Corporation. Offshore pipeline electrical survey method and apparatus. 4,228,399, Cl. 324-425.000.

Roba, Joseph L.: *See—*
Lambelin, Georges E.; Gillet, Claude L.; and Roba, Joseph L., 4,228,187, Cl. 424-330.000.

Robert Bosch GmbH: *See—*
Eberl, Leonhard, 4,227,498, Cl. 123-501.000.
Knapp, Heinrich; and Jaggle, Gunther, 4,227,501, Cl. 123-453.000.
Kreuzer, Helmut, 4,228,377, Cl. 310-263.000.
Ritter, Ernst, 4,227,504, Cl. 123-380.000.
Schnurle, Hans; and Bertsch, Richard, 4,227,491, Cl. 123-488.000.
Wessel, Wolf; Stein, Volkhard; Sauer, Rudolf; and Kienzle, Wolfgang, 4,227,500, Cl. 123-455.000.
Wessel, Wolf, 4,227,503, Cl. 123-454.000.

Roberts, Noel S., executor: *See—*
Hall, Hubert L., deceased, 4,227,875, Cl. 432-239.000.

Roberts, William A. Hospital bed monitor. 4,228,426, Cl. 340-573.000.

Robertshaw Controls Company: *See—*
Barker, Charles E., 4,228,346, Cl. 235-92.00T.

Robertson, Carl L. Cover for water closet seat. 4,227,267, Cl. 4-234.000.

Robyt, John F.; and Zikopoulos, John N., to Iowa State University Research Foundation, Inc. Method of inhibiting dextransucrase and oral compositions for use therein. 4,228,150, Cl. 424-48.000.

Roccaforte, Harry I., to Champion International Corporation. Self locking tray and blank for forming same. 4,227,640, Cl. 229-41.00C.

Rock, Erich; and Mages, Bernhard, to Julius Blum Gesellschaft m.b.H. Pull-out guide for drawers. 4,227,750, Cl. 308-3.800.

Rockwell International Corporation: *See—*
Cohen, Marshall J.; and Harris, James S., Jr., 4,227,943, Cl. 136-255.000.
Heredy, Laszlo A.; and McCoy, Lowell R., 4,228,224, Cl. 429-112.000.
Workman, Harold W.; and Nicholas, David C., 4,228,535, Cl. 370-16.000.

Roessler, Peter: *See—*
Grotkopp, Detlef; Wedemeyer, Karlfried; Brandes, Wilhelm; Scheinpflug, Hans; and Roessler, Peter, 4,228,181, Cl. 424-300.000.

Rohm GmbH: *See—*
Besecke, Siegmund; Gaenzler, Wolfgang; and Schroeder, Guenter, 4,228,102, Cl. 260-561.00N.

Rohowetz, Stanley E., to American Can Company. Primer system. 4,228,221, Cl. 428-469.000.

Rohr, Otto: *See—*
Fory, Werner; Bohner, Beat; Durr, Dieter; Pissiotas, Georg; Rohr, Otto; and Szczepanski, Henry, 4,227,914, Cl. 71-88.000.

Rohweder, Glen W.: *See—*
Mossman, Michael W.; and Rohweder, Glen W., 4,227,368, Cl. 56-106.000.

Rollenitz, Leopold: *See—*
Drasch, Josef; Firla, Gustav; Rollenitz, Leopold; and Scheiber, Robert, 4,227,783, Cl. 352-194.000.

Rolls-Royce Limited: *See—*
Kirker, Timothy J., 4,227,370, Cl. 60-262.000.
Williams, Peter J., 4,227,369, Cl. 60-734.000.

Rolock, Inc.: *See—*
Nugent, John J., 4,227,874, Cl. 432-261.000.

Rolston, John H.: *See—*
Butler, John P.; Rolston, John H.; den Hartog, James; Molson, Fred W. R.; and Goodale, John W., 4,228,034, Cl. 252-430.000.

Ronning Engineering Company, Inc.: *See—*
Ronning, Richard L., 4,227,448, Cl. 99-489.000.

Ronning, Richard L., to Ronning Engineering Company, Inc. Pellet pre-cooler for pellet mill. 4,227,448, Cl. 99-489.000.

Rooklyn, Jack, to Industrial Management Co. In-depth storage device. 4,227,466, Cl. 108-93.000.

Roper, Robert: *See—*
Powers, Kenneth W.; Roper, Robert; and Gorbaty, Martin L., 4,228,254, Cl. 525-256.000.

Roseen, Rutger A.: *See—*
Margen, Peter H. E.; Roseen, Rutger A.; and Zinko, Heimo, 4,227,511, Cl. 126-415.000.

Rosell, Jean, to Laperche. Multiple bolt latch. 4,227,723, Cl. 292-34.000.

Rosenfeld, Robert B., to Eastman Kodak Company. Ultrasonic imaging of internally fogged silver halide elements. 4,228,230, Cl. 430-3.000.

Ross Operating Valve Company: *See—*
Cameron, Russell J., 4,227,547, Cl. 137-554.000.

Rossier, Marc-Henry: *See—*
Lavanchy, Gerard A.; Rossier, Marc-Henry; and Mezger, Fritz, 4,227,565, Cl. 164-155.000.

Roth, Jurgen: *See—*
Bruning, Rolf; and Roth, Jurgen, 4,228,129, Cl. 422-102.000.

Rothbuhr, Lothar; and Voll, Manfred, to Deutsche Gold-Und Silber-Scheideanstalt Vormal Roessler. Apparatus for the production of carbon black. 4,228,131, Cl. 422-156.000.

Rothgery, Eugene F., to Olin Corporation. Amino ester derivatives of 3-trihalomethyl-1,2,4-thiadiazoles. 4,228,290, Cl. 548-128.000.

Rotter, Gerhard, to BASF Aktiengesellschaft. Method and apparatus for compensation of time base errors. 4,228,460, Cl. 358-127.000.

Rousseau, Alan D., to Minnesota Mining and Manufacturing Company. Photopolymerizable composition containing ethylenically unsaturated oligomers. 4,228,232, Cl. 430-271.000.

Royce Chemical Company: *See—*
Fono, Andrew, 4,227,881, Cl. 8-102.000.

Ruben, Samuel; and Kalker, Philip E., to eMDee Corporation. Attitude compensating indicator. 4,227,410, Cl. 73-301.000.

Rudolph, Hans: *See—*
Lachmann, Burkhard; Rudolph, Hans; and Cohnen, Wolfgang, 4,228,067, Cl. 260-45.85V.

Rueppel, Melvin L.; and Ting, Chihyuan C., to Monsanto Company. Method for the quantitative determination of cyanide. 4,227,888, Cl. 23-230.00R.

Ruffell, Anthony E.: *See—*
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Rusay, Ronald J.: *See—*
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Russ, Edward F.: *See—*
Reedy, Wayne R.; and Russ, Edward F., 4,227,721, Cl. 285-18.000.

Russell, Clayton C., to Fox Pool Corporation. Ground water level control system. 4,227,266, Cl. 4-496.000.

Rutenberg, Morton W.: *See—*
Chiu, Chung W.; and Rutenberg, Morton W., 4,228,199, Cl. 426-578.000.

Rutgerswerke Aktiengesellschaft: *See—*
Pastorek, Emmerich; Orth, Winfried; and Fickert, Werner, 4,228,083, Cl. 260-347.800.

Ruzicka, Jaromir; and Hansen, Elo H., to Bifok AB. Automatic analysis of alkali metals halides etc. by means of the use of ion-selective electrodes. 4,227,973, Cl. 204-1.00T.

Ruzin, Leonid M.; Spiridonov, Jury A.; Chuprov, Gennady S.; Tjunkin, Boris A.; and Tabakov, Vladimir P. Method of thermal-mine recovery of oil and fluent bitumens. 4,227,743, Cl. 299-2.000.

Ryan, Robert J.: *See—*
Martin, Carl J.; Voelker, Marvin J.; and Ryan, Robert J., 4,228,050, Cl. 260-23.0XA.

Ryder International Corporation: *See—*
Thomas, Michael D., 4,228,136, Cl. 422-307.000.

Ryding, Geoffrey, to Nova Associates, Inc. Wafer loading apparatus for beam treatment. 4,228,358, Cl. 250-457.000.

Ryu, Shoji: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.

S.D.S. Industries, Inc.: *See—*
Day, Robert L., 4,227,724, Cl. 292-145.000.

S. W. Hart & Co. Pty Ltd.: *See—*
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Saab-Scania Aktiebolag: *See—*
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Saathoff, Deidrich J.; and Venkatasetty, Hanumanthiyna V., to Honeywell Inc. Rechargeable electrochemical cell. 4,228,227, Cl. 429-194.000.

Sabee Products, Inc.: *See—*
Sabee, Reinhardt N., 4,227,952, Cl. 156-164.000.

Sabee, Reinhardt N., to Sabee Products, Inc. Method and apparatus for making diapers with elastic bands. 4,227,952, Cl. 156-164.000.

Sadamasa, Tetsuo: *See—*
Yasuda, Nobuaki; Ogawa, Takenobu; and Sadamasa, Tetsuo, 4,228,455, Cl. 357-67.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Gabano, Jean-Paul; and Grassien, Jean-Yves, 4,228,229, Cl. 429-196.000.

Saggers, Malcolm J.: *See—*
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St. Charles Manufacturing Co.: *See—*
Olson, Donald F., 4,227,902, Cl. 55-302.000.

Saint-Gobain Industries: *See—*
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Saito, Kazuhito: *See—*
Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, 4,228,429, Cl. 340-632.000.

Saito, Takemi: *See—*
Yamauchi, Toshiro; Saito, Takemi; and Kanayama, Shigehiro, 4,228,458, Cl. 358-55.000.

Saito, Toshio; Oguchi, Masao; and Kisaichi, Akio, to Kanebo, Ltd. Method of treating fiber or fibrous material. 4,227,882, Cl. 8-115.500.

Saito, Tsuyoshi: *See*—
Asano, Kiro; Saito, Tsuyoshi; Hatanaka, Masayoshi; and Ikeda, Susumu, 4,228,275, Cl. 536-18.000.
Sakakihara, Mizuo: *See*—
Hosoi, Yuzo; Shinoda, Noboru; Tsuchida, Yutaka; Sekino, Shozo; Sakakihara, Mizuo; and Murota, Shoji, 4,227,925, Cl. 75-171.000.
Sakano, Hajime; Kodama, Mikio; Shoji, Toshihiro; and Yoshida, Isao, to Sumitomo Naugatuck Co., Ltd. Thermoplastic resin composition having good heat cycle property. 4,228,051, Cl. 260-23.70R.
Sakano, Yukio, to Ricoh Company, Ltd. Document feed apparatus. 4,227,644, Cl. 235-433.000.
Sakuma, Fumio: *See*—
Soeda, Katsuji; Oyama, Mitsuhiro; Sakuma, Fumio; and Nakajima, Tadashi, 4,228,383, Cl. 318-245.000.
Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, to Ford Motor Company. Method of using Si_3N_4-Y_2O_3-SiO_2ceramic system for machining cast iron. 4,227,842, Cl. 409-131.000.
Sanden, Ulrich C., to Diessel GmbH & Co. Method and apparatus for the quantitative determination of beer ingredients. 4,228,192, Cl. 426-231.000.
Sander, Anthony J.; Sciffer, Jack P.; and Whitton, Richard W., to Australian Wire Industries Proprietary Limited. Controlling metal coatings on wire, strip and the like emerging from metal baths. 4,228,200, Cl. 427-47.000.
Sandoz, Inc.: *See*—
Bennett, Gregory B., 4,228,280, Cl. 544-184.000.
Houlihan, William J., 4,228,166, Cl. 424-250.000.
Sandoz Ltd.: *See*—
Greve, Manfred, 4,228,072, Cl. 260-156.000.
Jeck, Rudiger, 4,228,105, Cl. 568-325.000.
Sandrock, Harold E.; Leen, Morris W.; and Stark, Edward W., to Technicon Instruments Corporation. Cuvette and method of use. 4,227,810, Cl. 356-246.000.
Sands, William A.: *See*—
Kling, Stephen C.; and Sands, William A., 4,227,321, Cl. 36-91.000.
Sankyo Electric Company Limited: *See*—
Shirai, Isamu, 4,227,600, Cl. 192-84.00C.
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Sasaki, Hiromu: *See*—
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Satchell, David C., to David Satchell Products Limited. Hair curling apparatus. 4,227,541, Cl. 132-37.00R.
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Okonogi, Kyohei; Sato, Mikio; Mogaki, Katsuo; Sasaki, Takashi; and Uchida, Takashi, 4,228,235, Cl. 430-542.000.
Sato, Shuichi; and Yamaguchi, Tadanori, to Tektronix, Inc. Submicron channel length MOS inverter with depletion-mode load transistor. 4,228,447, Cl. 357-42.000.
Sato, Yasuhiko; Mizoguchi, Tomishige; Kudo, Yukitsuka; and Ishida, Ryuichi, to Tanabe Seiyaku Co., Ltd. Azepino [1,2,3-lm]-β-carboline compounds and pharmaceutical composition thereof. 4,228,168, Cl. 424-256.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing pressure buffer mechanism or constant pressure printing mechanism for hand-operated label printing machine. 4,227,456, Cl. 101-291.000.
Sato, Yoji: *See*—
Fujimoto, Ikuo; Isshiki, Setsuya; Kurita, Yoshikazu; and Sato, Yoji, 4,228,255, Cl. 525-288.000.
Sato, Yoshio: *See*—
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Satoh, Masakazu; Igarashi, Miyuki; and Senoo, Shigeo, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of detecting flaws on the surface of metal. 4,227,809, Cl. 356-237.000.
Sattlegger, Hans: *See*—
Genth, Hermann; Paulus, Wilfried; Schiller, Paul; Sattlegger, Hans; and Schnurrbusch, Karl, 4,228,065, Cl. 260-45.80N.
Satzinger, Gerhard: *See*—
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Sauer, Rudolf: *See*—
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Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. 1-Alkyl-2,2-dichloro-2(phosphinyl)acetates. 4,228,109, Cl. 260-941.000.
Saurer-Diederichs Societe Anonyme: *See*—
Volland, Michel F., 4,227,554, Cl. 139-310.000.
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Sawafuji, Tadashi. Electromagnetic type acoustic transducers. 4,228,327, Cl. 179-115.5ES.
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Saxer, Kurt: *See*—
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Scales, Stanley R.; and Sullivan, Eric C., to Hughes Tool Company. Method of hardfacing tool joints. 4,228,339, Cl. 219-77.000.
Scarato, Armand, to Societe Anonyme Dite: Delle-Alsthom. Gas-blast valve of a gas-blast circuit-breaker. 4,228,331, Cl. 200-144.00R.
Schaefer Marine, Inc.: *See*—
Merry, Carl A., 4,227,700, Cl. 277-12.000.
Schafer, Felix: *See*—
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Schantz, Spencer C. Compact solenoid with pin terminals. 4,228,415, Cl. 335-255.000.
Scharla-Nielsen, Hans; and Perkins, Frank A., to Harris Corporation. Real-time adaptive power control in satellite communications systems. 4,228,538, Cl. 455-9.000.
Schatz, Clarence H., to Scott Paper Company. Method of employing reclosable fastener tape system. 4,227,530, Cl. 128-287.000.
Scheiber, Robert: *See*—
Drasch, Josef; Firla, Gustav; Rollenitz, Leopold; and Scheiber, Robert, 4,227,783, Cl. 352-194.000.
Scheindel, Christian T. Pressurized fluid-actuated sound-producing device, and method of assembling it. 4,227,482, Cl. 116-142.0FP.
Scheiner, Jack F., to Vaughn Corporation. Electrical connector assembly with latching bar. 4,227,762, Cl. 339-91.00R.
Scheinpflug, Hans: *See*—
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Scherbring, David J., to Toro Company, The. Self-compensating brake system for a mowing machine. 4,227,364, Cl. 56-10.800.
Schick Incorporated: *See*—
Kanner, Gary L.; Kohler, Samuel H.; and Lewis, Robert E., 4,228,343, Cl. 219-225.000.
Schiele, Gert: *See*—
Jakszt, Werner; Reichelt, Klaus; and Schiele, Gert, 4,228,478, Cl. 361-128.000.
Schiller, Michael. Finger identification apparatus and method. 4,227,805, Cl. 356-71.000.
Schiller, Paul: *See*—
Genth, Hermann; Paulus, Wilfried; Schiller, Paul; Sattlegger, Hans; and Schnurrbusch, Karl, 4,228,065, Cl. 260-45.80N.
Schimitschek, Erhard J.; and Celto, John E., to United States of America, Navy. Pulsed cyclic laser based on dissociative excitation. 4,228,408, Cl. 331-94.50G.
Schindler, Harvey D.: *See*—
Sze, Morgan C.; and Schindler, Harvey D., 4,227,995, Cl. 208-251.00H.
Schindler, James; and Nugarus, Anthony R., to Restaurant Technology, Inc. Method for making scrambled eggs. 4,228,193, Cl. 426-233.000.
Schirer, David K.: *See*—
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Schleappe, Alvin E. Universal drive belt. 4,227,424, Cl. 474-256.000.
Schlenker, Robert W., to National Wire Products. Adjustable single unit masonry reinforcement. 4,227,359, Cl. 52-713.000.
Schliep, Edward. Carpenter square with tape holder. 4,227,314, Cl. 33-480.000.
Schloesser, Gert: *See*—
Grosch, Karl; Moitzheim, Paul; and Schloesser, Gert, 4,227,563, Cl. 152-354.00R.
Schlunssen, Christoffer: *See*—
Kjaer, Ian; Schlunssen, Christoffer; Moller, Hans J.; and Mortensen, Niels E., 4,227,539, Cl. 131-138.000.
Schmelzer Corporation: *See*—
Detweiler, Charles A.; and Rainwater, Dennis A., 4,227,445, Cl. 92-84.000.
Schmid, Bruce K.: *See*—
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Schmidlin, Robert: *See*—
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Schmidt, Hans-Dieter: *See*—
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Schmidt, Herbert J.: *See*—
Suciu, Thomas N.; and Schmidt, Herbert J., 4,227,537, Cl. 128-756.000.
Schmidt, Jimmy Q., to United States of America, Army. Electronic velocimeter having an oscillator coupled coil for measuring projectile muzzle velocity. 4,228,397, Cl. 324-179.000.

Schmidt, Volker: *See*—
Gross, Josef; Werner, Heinz; Schmidt, Volker; and Cremer, Heinz P., 4,227,741, Cl. 297-362.000.
Schmitt, Frederick L.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Vock, Manfred H.; Vinals, Joaquin F.; Kiwala, Jacob; Schmitt, Frederick L.; and Granda, Edward J., 4,228,026, Cl. 252-174.110.
Schmitt, Joseph M., to CY/RO Industries. Transparent blends of resinous copolymers and grafted elastomers. 4,228,256, Cl. 525-302.000.
Schmitz, Floyd A.; and Joy, William F., to J. I. Case Company. Releasable backhoe boom lock. 4,227,852, Cl. 414-694.000.
Schmoock, Roy F.; and Yard, John S., to Fischer & Porter Company. Harmonic noise suppression in electromagnetic flowmeter. 4,227,408, Cl. 73-861.170.
Schneider, Helmut, to Werner & Mertz GmbH. Discharge duct for apparatuses for extracting water from carpets. 4,227,316, Cl. 34-151.000.
Schneider, Hilmar. Valve for a spray container. 4,227,631, Cl. 222-635.000.
Schnell, William J.: *See*—
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Schnurle, Hans; and Bertsch, Richard, to Robert Bosch GmbH. Warm-up regulator for enriching the air-fuel mixture delivered to an internal combustion engine. 4,227,491, Cl. 123-488.000.
Schnurrbusch, Karl: *See*—
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Schoenenberger, Raymond, to Hatebur Umformmaschinen AG. Transfer mechanism for multiple punch presses. 4,227,390, Cl. 721-4.000.
Scholdstrom, Ragnar; Marcus, Holger; and Nordstrom, Lennart, to AGA Aktiebolag. Apparatus for measuring the distance to a point on the inner wall of a hot furnace. 4,227,802, Cl. 356-5.000.
Scholten, Joseph J. F.; and van de Leemput, Lambertus J. M. A., to Stamicarbon, B.V. Supported, chromium-oxide polymerization catalyst having a porous silica support used in the polymerization of olefines. 4,228,260, Cl. 526-106.000.
Scholten, Joseph J. F.; and van de Leemput, Lambertus J. M. A., to Stamicarbon, B.V. Supported chromium-oxide polymerization catalyst having a porous silica support used in the polymerization of olefines. 4,228,261, Cl. 526-106.000.
Schoolar, Richard B.: *See*—
Jensen, James D.; and Schoolar, Richard B., 4,227,948, Cl. 148-175.000.
Schoonmade, Bertus, to N.V. Optische Industrie "De Oude Delft". Apparatus for separating and removing a sheet from a stack of such sheets. 4,227,687, Cl. 271-139.000.
Schopper, Bernd; and Tandler, Peter, to ITT Industries, Inc. Braking pressure control unit for a dual circuit brake system. 4,227,746, Cl. 303-6.00R.
Schreyer, Gerd: *See*—
Ackermann, Rolf; Kolb, Heinz; Morlock, Gerhard; and Schreyer, Gerd, 4,228,084, Cl. 260-348.120.
Schroeder, Guenter: *See*—
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Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., to Gulf Research & Development Company. Paraffinic insulating oils containing a diarylalkane. 4,228,023, Cl. 252-63.000.
Schulz, Johann G. D.; Onopchenko, Anatoli; and Kofke, William A., to Gulf Research & Development Company. Insulating oil compositions containing a fraction derived from the alkylation product of benzene with ethylene. 4,228,024, Cl. 252-63.000.
Schumacher, John B. Rotatable ram bar apparatus and carrier adapter. 4,227,729, Cl. 293-145.000.
Schumacher, John C., to J. C. Schumacher Co. Energy efficient process for continuous production of thin semiconductor films on metallic substrates. 4,227,291, Cl. 29-572.000.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 3-(3,4-Dihydroxyphenyl)-N-(4-nitrobenzyl)alanine hydrobromide. 4,228,303, Cl. 562-435.000.
Schwanz, Wilfried; and Seiffert, Ulrich, to Volkswagenwerk Aktiengesellschaft. Device for longitudinal displacement of a flexible drive wire. 4,227,426, Cl. 74-424.80R.
Schwartz, Bertram: *See*—
Hartman, Robert L.; Koszi, Louis A.; Mogab, Cyril J.; and Schwartz, Bertram, 4,227,975, Cl. 204-15.000.
Schwartz, Sidney J., to Burroughs Corporation. Phase controlled decoder for bubble memories. 4,228,521, Cl. 365-4.000.
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Schwarze, Werner: *See*—
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Schwerdt, Christopher B., to United States of America, Air Force. Offset correction apparatus for a successive approximation A/D converter. 4,228,423, Cl. 340-347.0CC.
Schwertz, Jerome: *See*—
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Sciambi, Attilio F., Jr.: *See*—
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Sciffer, Jack P.: *See*—
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Scott, Hubert D.: *See*—
Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., 4,228,350, Cl. 250-267.000.
Scott, James W.: *See*—
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Scott, Phillips B.: *See*—
Dusheck, George J., Jr.; and Scott, Phillips B., 4,228,395, Cl. 324-77.00B.
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Sebag, Henri: *See*—
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Seefeld, Dean E.; and Schirer, David K., to Gehl Company. Bale processor. 4,227,654, Cl. 241-34.000.
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Sekmakas, Kazys; and Shah, Raj, to DeSoto, Inc. Aqueous coatings based on copolymers with a mixture of unsaturated esters of polymeric polyol and bisphenol-ethylene oxide adduct. 4,228,049, Cl. 260-21.000.
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Selsing, Jorgen, to G & W Electric Specialty Company. Method and means for dissipating heat in a high voltage termination. 4,228,318, Cl. 174-73.00R.
Senes, Michel; Le Goff, Yannick; Gourdier, Jean F.; and Quibel, Jacques, to Societe Chimique de la Grand e Paroisse. Catalytic composition used in purifying gaseous effluents polluted by nitrogen oxides and process for preparing the composition. 4,228,039, Cl. 252-462.000.
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Senoh, Hisao; and Senoh, Fushi. Exercise assembly with flexible bar mounting. 4,227,688, Cl. 272-62.000.
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Harlan, Courtney S., 4,227,572, Cl. 165-184.000.
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Shaw, Lynwood V.: *See*—
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Shelton, J. Paul, to United States of America, Navy. Wideband polarization-transforming electromagnetic mirror. 4,228,437, Cl. 343-909.000.
Shen, Chah M.: *See*—
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Shen, David T.: *See*—
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Shiga, Takashi, to Victor Company of Japan, Limited. Apparatus for searching a piece of information recorded on a magnetic tape. 4,228,471, Cl. 360-73.000.
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Shimenkov, Marat; and Froyman, Abraham. Article imitating a part of a woman's breast. 4,227,536, Cl. 128-479.000.
Shimizu, Masami; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Printed circuit assembly. 4,227,788, Cl. 354-60.00R.
Shimizu, Masami: *See*—
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Shionogi & Co., Ltd.: *See*—
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Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Preparation of 2,4,6-triisobutyl dihydro-1,3,5-dithiazine. 4,228,278, Cl. 544-5.000.
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Siddi, Giorgio: *See*—
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Siefert, Roland, to Kienzle Uhrenfabriken GmbH. Autonomous pendulum mechanism for clockworks. 4,228,533, Cl. 368-134.000.
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Siempelkamp Giesserei GmbH: *See*—
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Signode Corporation: *See*—
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Sih, John C., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-19-hydroxy-PG$_1$ analogs. 4,228,104, Cl. 568-379.000.
Silicon Valley Group, Inc.: *See*—
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Hein, Carl C., III; Lempke, Russell J.; Silver, Harold K.; Spitz, Joseph J.; and Seidler, Don W., 4,228,215, Cl. 428-216.000.
Silverman, Irving. Board game. 4,227,696, Cl. 273-260.000.
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Simcoe, Robert J.; and Finch, David C., to General Electric Company. System and method of power demand limiting and temperature control. 4,228,511, Cl. 364-506.000.
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Simpson, Anne L.: *See*—
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Sims, Claude C. Piezoelectric transducer. 4,228,532, Cl. 367-159.000.
Sizelove, Cary L.; and Wells, Donald G., to Chromalloy American Corporation. Suspension for silo unloaders. 4,227,836, Cl. 406-114.000.
Skandinavisk Tobakskompagni A/S: *See*—
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SKF Industries, Inc.: *See*—
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Slater, Saul I., to Hov-Air-Ship, Inc. Composite magnet and magnetic anchoring. 4,228,416, Cl. 335-295.000.
Slavinsky, Valentin N.; Bairon, Genrikh V.; Alexandrov, Adolf M.; Alexeev, Gennady M.; Savenok, Alexandr F.; Matveev, Vladimir M.; Elin, Fedor E.; Provalsky, Gennady B.; Shulbakh, Boris P.; and Tsimbler, Jury A. Device for delivery of bulk materials. 4,227,451, Cl. 100-295.000.
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Smith, Elmer G.: *See*—
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Durant, Graham J.; Emmett, John C.; and Genellin, Charon R., 4,228,291, Cl. 548-138.000.
Smith, Leland B., to Unirad Corporation. Electronic black matrix circuitry. 4,228,459, Cl. 358-112.000.
Smith, Michael D.; Mason, Eric K. L.; and Morley, Robert J., to Courtaulds Limited. Composite material of facing layer and pile key fabric. 4,228,208, Cl. 428-95.000.
Smith, Robert H.: *See*—
Dearth, James D.; and Smith, Robert H., 4,227,990, Cl. 208-8.00R.
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Bondinell, William E.; and Pendleton, Robert G., 4,228,170, Cl. 424-258.000.
Snedkerud, Ole; and Wild, Peter J., to BBC Brown Boveri & Company Limited. Device for the electro-optical display of the tuning of a television and/or sound radio receiver. 4,228,541, Cl. 455-158.000.
Snow, Samuel G.; and Giacomelli, Edward J., to United States of America, Energy. Method for measuring the density of lightweight materials. 4,228,351, Cl. 250-273.000.

Snyder, Gary F.: *See—*
Bringol, Charles R.; and Snyder, Gary F., 4,228,322, Cl. 179-15.55T.
Snyder, Richard C.: *See—*
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Societa Impianti Termoelettrici Industriali (s.a.s.): *See—*
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Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
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Societe Anonyme Automobiles Citroen: *See—*
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Societe Anonyme Dite: Delle-Alsthom: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
Wattin, Jean-Jacques, 4,227,569, Cl. 165-35.000.
Societe Chimique de la Grand e Paroisse: *See—*
Senes, Michel; Le Goff, Yannick; Gourdier, Jean F.; and Quibel, Jacques, 4,228,039, Cl. 252-462.000.
Societe Civile d'Etudes et de Recherches pour L'Obtention de Fibres Minerales (S.E.R.O.F.I.M.): *See—*
Porte, Pierre; and Togny, Jean, 4,228,207, Cl. 428-80.000.
Societe d'Etudes, de Realisations et d'Applications Techniques: *See—*
Precoul, Michel, 4,227,438, Cl. 89-1.816.
Societe Europeenne de Propulsion: *See—*
Donguy, Paul J., 4,227,858, Cl. 416-134.00A.
Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Martel, Bernard, 4,227,496, Cl. 123-440.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Gouzien, Michel J. Y.; and Ortega, Edwin, 4,227,859, Cl. 416-134.00A.
Soderberg, Terje, to Guternic AB. Method and apparatus for aligning and stapling sheets of paper. 4,227,275, Cl. 11-1.00R.
Soeda, Katsuji; Oyama, Mitsuhiro; Sakuma, Fumio; and Nakajima, Tadashi, to Yamamoto Electric Industries, Ltd. Speed control circuit arrangement for an AC commutator motor. 4,228,383, Cl. 318-245.000.
Solar Pump Corporation: *See—*
Stubbs, Harvard P., 4,227,866, Cl. 417-379.000.
Solartron Electronic Group Limited, The: *See—*
Dalley, Robert J.; Owen, Robert D.; and Parmenter, George S., 4,228,412, Cl. 335-152.000.
Solomin, Vladimir A.: *See—*
Popov, Alexandr D.; and Solomin, Vladimir A., 4,228,372, Cl. 310-13.000.
Somerville, Mark: *See—*
Black, Herbert L.; Somerville, Mark; and Schwertz, Jerome, 4,227,927, Cl. 75-225.000.
Sommerer, Raymond. Centrifugal aspirator. 4,227,863, Cl. 417-169.000.
Sone, Kiyoshi: *See—*
Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, 4,228,429, Cl. 340-632.000.
Sone, Masazumi; Suzuki, Kazuhiko; and Fukumori, Yukitsugu, to Nissan Motor Company, Limited. Electronic air cleaner for passenger compartment of vehicle. 4,227,446, Cl. 98-2.110.
Sony Corporation: *See—*
Himuro, Masami; Yamada, Toshiro; and Makino, Yoshimi, 4,228,473, Cl. 360-114.000.
Soodak, Charles; Lamadrid, Rene G.; and Lohr, David, to Baxter Travenol Laboratories, Inc. Optical density detector. 4,227,814, Cl. 356-410.000.
Sorensen, Calvin P.: *See—*
Loeffler, Romain E.; Sorensen, Calvin P.; and Weinstein, Larry J., 4,227,960, Cl. 156-519.000.
Sorensen, Norman L., to Wisco Corporation. Sunroof forward edge latch. 4,227,738, Cl. 296-224.000.
Sorensen, Norman L., to Wisco Corporation. Sunroof opening and locking device. 4,227,739, Cl. 296-224.000.
Sorimachi, Akira, to Katoh Electrical Machinery Co., Ltd. Door operating equipment. 4,227,726, Cl. 292-251.500.
Sound-Mate Inc.: *See—*
Plummer, Jan P., 4,228,402, Cl. 179-1.0VL.
Spangler, Charles W.; and Haymes, Eugene S., to General Electric Company. Stack height sensor and elevator control for a continuous forms refolder. 4,227,683, Cl. 270-61.00F.
Spar Aerospace Limited: *See—*
Woodford, Alan T.; and Horellou, Michel R., 4,227,853, Cl. 414-738.000.
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Speckman, Donald T.: *See—*
Clark, Clarence O.; Flautt, Thomas J., Jr.; and Speckman, Donald T., 4,228,334, Cl. 219-10.55E.
Spector, Donald; and Burch, Anita. Convertible women's ensemble. 4,227,264, Cl. 2-84.000.
Speicher, Edwin W., to M. E. Cunningham, Company. Hydraulically operated drum series printer. 4,227,454, Cl. 101-93.010.
Speranza, George P.; Zimmerman, Robert L.; and Austin, Thomas H., to Texaco Development Corp. Polyol preparation. 4,228,310, Cl. 568-620.000.
Sperry Corporation: *See—*
Griffith, Carl D., 4,228,386, Cl. 318-628.000.
Pucher, Richard A., 4,227,366, Cl. 56-14.200.
Skutecki, Edmund R., 4,227,664, Cl. 244-194.000.
Waite, John C.; and Baber, David J., 4,228,503, Cl. 364-200.000.
Sperry Rand Corporation: *See—*
Colby, Richard A.; Parolini, Leo B.; and Butler, L. Dennis, 4,227,845, Cl. 414-39.000.
Spiridonov, Jury A.: *See—*
Ruzin, Leonid M.; Spiridonov, Jury A.; Chuprov, Gennady S.; Tjunkin, Boris A.; and Tabakov, Vladimir P., 4,227,743, Cl. 299-2.000.
Spirig, Ernst. Method and apparatus for testing solderability and de-soldering wicks. 4,227,415, Cl. 73-432.00R.
Spitz, Joseph J.: *See—*
Hein, Carl C., III; Lempke, Russell J.; Silver, Harold K.; Spitz, Joseph J.; and Seidler, Don W., 4,228,215, Cl. 428-216.000.
Spitzer, Hermann J. Solar energy collectors. 4,227,514, Cl. 126-426.000.
Sporlan Valve Company: *See—*
Lange, Harold T., 4,227,901, Cl. 55-301.000.
Spotnails, Inc.: *See—*
Medina, Conrad R.; and Ramiro, Wifredo L., 4,227,638, Cl. 227-155.000.
Sprague, Peter W., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane and 7-oxabicycloheptene prostaglandin analogs. 4,228,180, Cl. 424-285.000.
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Zorn, Milton J.; Slater, Edward L.; Maizner, Neil L.; Eccles, Brian J.; Minard, Hubert C.; Otsuki, Juko S.; and Sprengart, Daniel H., 4,227,786, Cl. 354-10.000.
Springolo, Mario; and Lorenzini, Umberto, to Societa Italiana Telecomunicazioni Siemens S.p.A. Interface unit for data exchange between a central processor and a peripheral unit in TDM telecommunication system. 4,228,499, Cl. 364-200.000.
Spycher, Anton A., to Corning Glass Works. Direct casting method for producing low-stress glass/plastic composite lenses. 4,227,950, Cl. 156-85.000.
Staeubli, Ltd.: *See—*
Schwarz, Rudolf, 4,227,553, Cl. 139-82.000.
Staff KG: *See—*
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Stal Refrigeration AB: *See—*
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Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., to General Electric Company. Gas seal with tip of abrasive particles. 4,227,703, Cl. 277-53.000.
Stamicarbon, B.V.: *See—*
Scholten, Joseph J. F.; and van de Leemput, Lambertus J. M. A., 4,228,260, Cl. 526-106.000.
Scholten, Joseph J. F.; and van de Leemput, Lambertus J. M. A., 4,228,261, Cl. 526-106.000.
van Gasse, Rene L. E., 4,228,113, Cl. 264-24.000.
Standard Oil Company: *See—*
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Standard Oil Company (Indiana): *See—*
Partenheimer, Walter, 4,228,091, Cl. 260-439.00R.
Zimmerschied, Wilford J., 4,227,971, Cl. 203-32.000.
Zimmerschied, Wilford J., 4,228,307, Cl. 562-608.000.
Stanulonis, John J.: *See—*
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Stark, Edward W.: *See—*
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Start S.p.A. Studi Apparecchiature E Ricerche Tecniche: *See—*
Fasano, Osvaldo, 4,227,603, Cl. 192-111.00A.
Stauffer Chemical Company: *See—*
Felix, Raymond A., 4,228,185, Cl. 424-324.000.
Gray, Reed A.; Tseng, Chien K.; and Rusay, Ronald J., 4,227,919, Cl. 71-122.000.
Steckler, Steven A.; and Balaban, Alvin R., to RCA Corporation. Switched AFPC loop filter with offset voltage cancellation. 4,228,463, Cl. 358-158.000.
Stegmann, Rudolph: *See—*
Laucks, F. Michael; and Stegmann, Rudolph, 4,227,380, Cl. 62-217.000.
Steigelman, James Q.; Bargainnier, Roger B.; Shaffer, Glenn A., deceased; by Charland, Irene S., administrator DBN CTA; and Harris, Geoffrey L., to GTE Products Corporation. Flexible bilayered sheet, one layer of which contains abrasive particles in a volatilizable organic binder and the other layer of which contains alloy particles in a volatilizable binder, method for producing same and coating produced by heating same. 4,228,214, Cl. 428-212.000.
Stein, Volkhard: *See—*
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Steinbach, Robert L., to Chicago Lock Co. Axial split-pin tumbler-type lock mechanism. 4,227,387, Cl. 70-363.000.
Steiner, Edward, to Xerox Corporation. Protection system for electrostatographic machines. 4,227,798, Cl. 355-14.00C.
Steinlehner, Fritz: *See—*
Massengeil, Hans A.; Bock, Georg; and Steinlehner, Fritz, 4,227,803, Cl. 355-50.000.
Steinwart, Johannes; and Bauder, Armin, to Audi NSU Auto Union. Fuel injection system. 4,227,502, Cl. 123-454.000.

Stelron Cam Company: *See*—
Beezer, Earl F., 4,227,851, Cl. 414-626.000.
Stenkvist, Sven-Einar, to ASEA Aktiebolag. DC Arc furnace hearth. 4,228,314, Cl. 13-9.00R.
Sterling Drug Inc.: *See*—
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Stern, Eric P.; Venta, George J.; Mia, Riad; and Vines, Solomon M., to Exxon Research & Engineering Co. Composite foam roof insulation. 4,227,356, Cl. 52-309.400.
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Stewart, Robert D.; and Gamble, Robert L., to Foster Wheeler Energy Corporation. Fluidized bed unit including a cooling device for bed material. 4,227,488, Cl. 122-4.00D.
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Haas, Gerhard J.; and Stieglitz, Barry, 4,228,191, Cl. 426-45.000.
Stifter, Francis J. Constant current source. 4,228,494, Cl. 363-85.000.
Stilber, John. Building solar energy heating system and cooling system. 4,227,566, Cl. 165-1.000.
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Stone, Barry N.; and Lambert, Thomas W., to General Electric Company. Analog video convolver for real time two-dimensional image processing. 4,228,465, Cl. 358-166.000.
Stoy, Artur, to Ceskoslovenska akademie ved. Shaped articles from insoluble hydrogels and method of manufacturing same. 4,228,056, Cl. 260-29.6AN.
Strain, Harold: *See*—
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Stratynski, Eugene; and Zilic, Charles, to Eaton Corporation. Temperature responsive actuator. 4,227,412, Cl. 73-368.300.
Stricker, Jesse C.; and Wagner, Dennis L., to Black Body Corporation. Traveling infrared bell oven system. 4,228,345, Cl. 219-388.000.
Stroman, Marlin H. Dual attitude golf bag. 4,227,559, Cl. 150-1.50R.
Strong, Barry C.: *See*—
Whittaker, Leonard B.; Clayton, William; Marriott, Eric W.; and Strong, Barry C., 4,227,385, Cl. 66-82.00R.
Stubbs, Harvard P., to Solar Pump Corporation. Solar energy device. 4,227,866, Cl. 417-379.000.
Stubdal, Jorn: *See*—
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Studhalter, Walter R.: *See*—
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Subramanian, Krishnamoorthy: *See*—
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Samanta, Shyam K.; Subramanian, Krishnamoorthy; and Ezis, Andre, 4,227,842, Cl. 409-131.000.
Subramanian, Sundaresa V.; Ghosh, Debabrata S.; Gray, John M.; Kay, David A. R.; and Purdy, Gary R., to Microalloying International, Inc. Process for the production of vermicular cast iron. 4,227,924, Cl. 75-130.00R.
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Suematsu, Toshio: *See*—
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Sugikawa, Susumu; Maeda, Mitsuru; and Tsujino, Takeshi, to Japan Atomic Energy Research Institute. Process for a gasification of graphite. 4,228,141, Cl. 423-415.00A.
Sugio, Akitoshi; Masu, Masanobu; Kimura, Masaharu; Sayama, Norio; Ko, Keiun; and Yonemitsu, Eiichi, to Mitsubishi Gas Chemical Company, Inc. Resin composition containing polyphenylene oxide. 4,228,258, Cl. 525-390.000.
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Sumitomo Chemical Company, Limited: *See*—
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Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
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Sunnen Products Company: *See*—
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Superscope, Inc.: *See*—
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Sutter, Jean G.; and Percebois, Alain A. P., to Pont-A-Mousson S.A. Butterfly valve structure and a sleeve therefor. 4,227,675, Cl. 251-173.000.
Suzuki, Kazuhiko: *See*—
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Suzuki, Shigeto, to Chevron Research Company. Process for preparing acetic acid derivatives. 4,228,305, Cl. 562-579.000.
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Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.
Swanson, Damon, to Allor Foundation, The. Method of laboratory testing in water-based culture media for zones of inhibition. 4,228,238, Cl. 435-32.000.
Swift, Harold E.; Stanulonis, John J.; and Reynolds, Elizabeth H., to Gulf Research & Development Company. Alumina-aluminum phosphate-silica-zeolite catalyst. 4,228,036, Cl. 252-437.000.
Swiss Aluminum Ltd.: *See*—
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Syntex Puerto Rico, Inc.: *See*—
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Hulyalkar, Ramchandra K.; and Lauzon, Rodrigue V., 4,228,058, Cl. 260-29.7UA.
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Sze, Morgan C.; and Schindler, Harvey D., to Lummus Company, The. Demetallization of hydrocarbon feedstock. 4,227,995, Cl. 208-251.00H.
Szebeni, Rudolf; Korbonits, Dezso; Harsanyi, Kalman; Molnar, Leventene; Szekeres, Laszlo; Papp, Gyula; and Sebestyen, Gyula, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Condensed purine derivatives useful for improving peripheral circulation. 4,228,164, Cl. 424-246.000.
Szejtli, Josef; Szente, Lajos; David, Agoston; Virag, Sandor; Sebestyen, Gyula; and Mandi, Attila, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Inclusion complex of cyclodextrin and indomethacin and a process for the preparation thereof, method of use and pharmaceutical composition. 4,228,160, Cl. 424-180.000.
Szekeres, Laszlo: *See*—
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Tabakov, Vladimir P.: *See*—
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Tabin, Frank. Photographic film processing apparatus. 4,227,794, Cl. 354-299.000.
Tacke, Horst: *See*—
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Tadmor, Zehev: *See*—
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Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Process for forming a single-crystal film. 4,227,961, Cl. 156-608.000.
Takahashi, Tatsuo; and Yamada, Osamu, to RCA Corporation. High temperature cadmium boracite semiconductor device. 4,228,454, Cl. 357-61.000.
Takahashi, Yoshihiro; Moore, Robert T.; and Joyce, Robert J., to Envirotech Corporation. Determination of total organic halides in water. 4,227,887, Cl. 23-230.0PC.
Takase, Sadao; Asano, Masaharu; and Manaka, Nobuzi, to Nissan Motor Company, Limited. Air/fuel ratio control system for internal combustion engine with airflow rate signal compensation circuit. 4,227,507, Cl. 123-492.000.
Takase, Takao: *See*—
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Takata, Akira: *See*—
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Takayanagi, Motowo; and Kajiyama, Tisato, to Takayanagi, Motowo; and Asahi Kasei Kogyo Kabushiki Kaisha. Polymer composite material. 4,228,218, Cl. 525-58.000.
Takeda Chemical Industries, Ltd.: *See*—
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Takeda Chemical Industries, Ltd: *See*—
Higashide, Eiji; Hatano, Kazunori; and Asai, Mitsuko, 4,228,239, Cl. 435-119.000.
Takeuchi, Hiroo, to Nissin Kogyo Kabushiki Kaisha. Automotive brake booster device. 4,227,371, Cl. 60-547.00R.
Talansky, Alan R.; Respess, Herman M.; and Borst, William A., to Tibar Corporation. Interface device. 4,227,308, Cl. 33-169.00B.
Talcott, Thomas D., to Dow Corning Corporation. Method of storing blood and a blood storage bag therefore. 4,228,032, Cl. 252-400.00R.
Tam, Johann, to Silicon Valley Group, Inc. Two motor drive for a wafer processing machine. 4,227,347, Cl. 51-235.000.
Tamai, Masayoshi, to Fuji Xerox Co., Ltd. Printing machine. 4,227,452, Cl. 101-1.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Kiguchi, Tasaburo; Hayashi, Kimiaki; and Yamaguchi, Isao, 4,228,183, Cl. 424-301.000.
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Katzman, James A.; Bartlett, Joel F.; Bixler, Richard M.; Davidow, William H.; Despotakis, John A.; Graziano, Peter J.; Green, Michael D.; Greig, David A.; Hayashi, Steven J.; Mackie, David R.; McEvoy, Dennis L.; Treybig, James G.; and Wierenga, Steven W., 4,228,496, Cl. 364-200.000.
Tandler, Peter: *See*—
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Tang, David Y.; and Foster, Arthur M., to Hooker Chemicals & Plastics Corp. Phenyl-alpha,beta-epoxy-beta-(3-trifluoromethylphenyl)ethyl ketone and process for its production. 4,228,085, Cl. 260-348.490.
Tanuma, Itsuo: *See*—
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Tasch, Al F., Jr.; and Chatterjee, Pallab K., to Texas Instruments Incorporated. Dual plane well-type two-phase ccd. 4,228,445, Cl. 357-24.000.
Tassoni, Robert. Apparatus for scribing wall panels. 4,227,307, Cl. 33-41.00F.
Tate & Lyle Limited: *See*—
Burge, Malcolm L. E.; and Nechutny, Zdenek L. A. Z., 4,228,198, Cl. 426-548.000.
Taub, Bernard; Harnish, Daniel F.; and Jones, Philip E., to Allied Chemical Corporation. Manufacture of fluorocarbon expanded polystyrene. 4,228,246, Cl. 521-98.000.
Taunton, John W.: *See*—
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Tawara, Katsuya: *See*—
Ogata, Masaru; Watanabe, Yoshihachi; Matsumoto, Hiroshi; and Tawara, Katsuya, 4,228,165, Cl. 424-248.500.
Taylor, Dennis R.; and Jones, Mark, to Filtrol Corporation. Method of producing faujasite zeolites employing seeding techniques. 4,228,137, Cl. 423-118.000.
Taylor, Donald F.: *See*—
Pearce, Joseph L.; Ray, Thomas W.; Taylor, Donald F.; and Yonker, John H., 4,227,573, Cl. 166-153.000.
Taylor, Glenn N., to Kendall Company, The. Method of catheter manufacture. 4,227,293, Cl. 29-447.000.
TDK Electronics Company, Limited: *See*—
Okamura, Masatoshi; Shiba, Haruo; and Tanaka, Kimio, 4,227,622, Cl. 220-4.00B.
Technicon Instruments Corporation: *See*—
Sandrock, Harold E.; Leen, Morris W.; and Stark, Edward W., 4,227,810, Cl. 356-246.000.
Technion Research & Development Foundation: *See*—
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Teknoware Oy: *See*—
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Tektronix, Inc.: *See*—
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Temco Products, Inc.: *See*—
Thomas, Morton I., 4,227,742, Cl. 297-430.000.
Tenneco Chemicals, Inc.: *See*—
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Tennichi, Yasuhiro: *See*—
Matsumoto, Hiroshi; Sato, Yoshio; Kawano, Shigeyoshi; Nakano, Yoshiyuki; Kato, Fumio; Hisano, Katsukuni; Kashiwahara, Katsuto; Otawara, Yasuhiko; Higashi, Toshihiko; Tennichi, Yasuhiro; Matsumura, Jube; and Fukushima, Koichiro, 4,228,359, Cl. 290-40.00R.
Terai, Kenji: *See*—
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Terrafix Erosion Control Products, Inc.: *See*—
Crowe, Robert E., 4,227,834, Cl. 405-303.000.
Terutaka, Yao: *See*—
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Terzian, Rouben T.: *See*—
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Tesdahl, Thomas C., to Chemed Corporation. Foam cleaner for food plants. 4,228,048, Cl. 260-17.4UC.
Tessier, Michel: *See*—
Jouve, Hubert; Meyer, Robert; Sztern, Jacques; Krishnan, Ramanathan; Suran, Gabor; and Tessier, Michel, 4,227,947, Cl. 148-122.000.
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Hunter, Walter D., 4,228,016, Cl. 252-8.55D.
Hunter, Walter D., 4,228,017, Cl. 252-8.55D.
Hunter, Walter D., 4,228,018, Cl. 252-8.55D.
Hunter, Walter D., 4,228,019, Cl. 252-8.55D.
Speranza, George P.; Zimmerman, Robert L.; and Austin, Thomas H., 4,228,310, Cl. 568-620.000.
Zimmerman, Robert L., 4,228,248, Cl. 521-115.000.
Texaco Inc.: *See*—
Calderon, Reynaldo, 4,227,576, Cl. 166-312.000.
Nooner, Daryl W., 4,227,575, Cl. 166-303.000.
Paap, Hans J.; Richter, Albert P., Jr.; Peelman, Harold E.; Arnold, Dan M.; and Scott, Hubert D., 4,228,350, Cl. 250-267.000.
Texas Instruments Incorporated: *See*—
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Textron, Inc.: *See*—
Carlson, Floyd W.; Hester, Michael L.; and Popelka, David A., 4,227,665, Cl. 244-210.000.
Reyes, Peter A., 4,227,857, Cl. 416-134.00A.
Thate, Kurt, to AGFA-Gevaert, A.G. Inflatable sealing device. 4,227,702, Cl. 277-34.300.
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Foster, Robert B., 4,228,004, Cl. 210-739.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile apparatus for distributing and shaping ballast of a railroad bed. 4,227,324, Cl. 37-104.000.
Thillays, Jacques-Claude, to U.S. Philips Corporation. Display device for use with strong illumination. 4,228,490, Cl. 362-311.000.
Thivierge, Clovis. Drilling attachment for chain saw. 4,227,840, Cl. 408-20.000.
Thomas, Michael D., to Ryder International Corporation. Lens holder and sterilizer. 4,228,136, Cl. 422-307.000.
Thomas, Morton I., to Temco Products, Inc. Multi-position, retractable leg rest for a wheelchair. 4,227,742, Cl. 297-430.000.
Thompson, John W.; Kamp, Arthur J.; and Sederlund, Edward R., to Dow Chemical Company, The. Nuclear pulse counting apparatus and technique. 4,228,512, Cl. 364-527.000.
Thompson, Marion E. Solar sign assembly. 4,227,327, Cl. 40-473.000.
Thomson-CSF: *See*—
de Sartre, Jean; and Geiger, Erich, 4,228,493, Cl. 363-56.000.
Dubois, Jean C.; and Barre, Francoise, 4,228,087, Cl. 260-408.000.
Pearsall, Thomas P., 4,228,453, Cl. 357-60.000.
Thoren, Sten. Method and device for improving the efficiency of a heat generator. 4,227,378, Cl. 62-82.000.
Thyssen Industrie AG: *See*—
Kreiskorte, Heinz, 4,227,450, Cl. 100-214.000.
Tibar Corporation: *See*—
Talansky, Alan R.; Respess, Herman M.; and Borst, William A., 4,227,308, Cl. 33-169.00B.
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Ursrey, Curtis W.; and Tillery, Richard L., 4,227,331, Cl. 43-17.600.
Timex Corporation: *See*—
Bissar, Saadi; and George, Douglas, 4,227,779, Cl. 350-357.000.
Timm, Hans; Fries, Soren; and Wenzlaff, Axel, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Apparatus for desalination and purification of water by reverse osmosis and ultrafiltration. 4,228,014, Cl. 210-321.00R.
Ting, Chihyuan C.: *See*—
Rueppel, Melvin L.; and Ting, Chihyuan C., 4,227,888, Cl. 23-230.00R.
Ting, Raymond M. L.: *See*—
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Avalon, Max; Kowalski, John L.; and Tippetts, K. Boyd, 4,227,289, Cl. 29-33.00K.
Tjaden, Jan, to Internationale Octrooi Maatschappij "Octropa" B.V. Plate heat exchanger. 4,227,571, Cl. 165-167.000.
Tjannberg, Bo C. E. Method for making a cellulosic material fire-resistant. 4,228,202, Cl. 427-212.000.

Tjunkin, Boris A.: *See*—
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Mowry, William H., Jr.; McElligott, Michael J.; Tkalenko, Victor J., Jr.; and Baran, Joseph, 4,227,720, Cl. 283-8.00R.
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Tohyama, Shigeo; and Akitomo, Nobuo, to Hitachi, Ltd. Spectrophotometer. 4,227,811, Cl. 356-325.000.
Tojo, Tsutomu; and Uetake, Toshifumi, to Olympus Optical Co., Ltd. Objective lens system for microscopes. 4,227,773, Cl. 350-175.0ML.
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Tokyo Denryoki Kabushiki Kaisha: *See*—
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Yasuda, Nobuaki; Ogawa, Takenobu; and Sadamasa, Tetsuo, 4,228,455, Cl. 357-67.000.
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Tom, Baldwin H.: *See*—
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Tompkins, Leo; and Strain, Harold. Desiccant thermal energy storage system for compact heating and cooling. 4,227,375, Cl. 62-2.000.
Tonka Corporation: *See*—
Murray, Dale L.; and Dohse, Jerry L., 4,227,337, Cl. 46-12.000.
Toot, Peter D., to General Electric Company. Fail-fixed servovalve. 4,227,443, Cl. 91-459.000.
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Toray Silicone Company, Ltd.: *See*—
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Toro Company, The: *See*—
Comer, Robert C., 4,227,280, Cl. 15-330.000.
Scherbring, David J., 4,227,364, Cl. 56-10.800.
Torrance, William L. Shaving apparatus. 4,227,302, Cl. 30-47.000.
Torrington, Leslie A., to RCA Corporation. Manual scanning mechanism for video disc player. 4,227,699, Cl. 274-13.00R.
Towa Dengyo Co., Ltd.: *See*—
Matsuya, Ryosuke, 4,228,486, Cl. 362-237.000.
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Blaha, James G., 4,227,704, Cl. 277-84.000.
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Toyota Kidosha Kogyo Kabushiki Kaisha: *See*—
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Trisops Inc.: *See*—
Wells, Daniel R., 4,228,380, Cl. 315-111.400.
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Rigler, Josef K.; Leithauser, Horst; Trukenbrod, Karl; and Ogrzewalla, Werner, 4,228,244, Cl. 521-56.000.
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Clewes, Antony B.; and Bowley, Thomas W., 4,227,768, Cl. 339-198.00H.
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Tsuchida, Takashi; Shinoda, Kenichi; and Takase, Takao, to Fuji Electrochemical Co., Ltd. Rupturable sealing structure of cell. 4,227,701, Cl. 277-12.000.
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Tsuchiya, Keishin; Yoshihara, Ichiro; Saito, Kazuhito; Abe, Takeshi; Abe, Kiyoshi; and Sone, Kiyoshi, to Ricoh Company, Ltd. Alarm system having phase-sensitive bridge circuit. 4,228,429, Cl. 340-632.000.
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Tsunekawa, Tokuichi: *See*—
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Tsunoi, Haruo, to Canon Kabushiki Kaisha. Wet developing apparatus for electrostatic latent images. 4,227,797, Cl. 355-10.000.
Tucker, Robert W., to United States of America, Army. Lock out proximity fuze amplifier. 4,227,462, Cl. 102-220.000.
Tucson Medical Instruments, Inc.: *See*—
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Tureaud, Kenneth E.; Ginsburg, Stephen; and Draheim, Frederick, to Black Knight Investments, Limited. Anatomical intra-orally moldable dental impression tray and method. 4,227,877, Cl. 433-37.000.
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Tuson, Samuel, to Entreprise d'Equipements Mecaniques et Hydrauliques E.M.H. Ancillary off-shore column located near a sea-bed working column or platform. 4,227,830, Cl. 405-195.000.
Tuvin, Yury: *See*—
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Uchida, Shinya; and Arikawa, Junichi, to Laurel Bank Machine Co., Ltd. Apparatus for extraction of desired number of sheets for use in a sheet counting machine. 4,227,686, Cl. 271-95.000.
Uchida, Takashi: *See*—
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Uchikawa, Hiroshi; and Kato, Hajime, to Onoda Cement Co., Ltd. Self-hardening mold sand. 4,227,931, Cl. 106-38.350.
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Uitvlugt, Martin W., to Eaton Corporation. Valve disabler and control. 4,227,494, Cl. 123-90.160.

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Ullrich, Gunter. Catamaran equipped with re-righting device. 4,227,474, Cl. 114-61.000.
Ulveling, Leon; Mailliet, Pierre; and Metz, Jean, to Wurth, Paul. Guide and support structure for furnace taphole plugging or drilling device. 4,227,682, Cl. 266-271.000.
Under Sea Industries, Inc.: *See*—
Hart, Dennis; and Shiroishi, Masaru, 4,227,521, Cl. 128-202.140.
Underground Location Services Limited: *See*—
Jones, Trevor C., 4,227,309, Cl. 33-178.00E.
Underwood, James L. Sealing lid and sealing lid-container combination. 4,227,625, Cl. 220-307.000.
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Bryant, David R., 4,228,094, Cl. 260-450.000.
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Grosch, Karl; Moitzheim, Paul; and Schloesser, Gert, 4,227,563, Cl. 152-354.00R.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
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Balinski, Henry A., 4,227,360, Cl. 52-720.000.
Luszczak, Myron M., 4,227,965, Cl. 162-13.000.
Wendt, Alan C., 4,227,355, Cl. 52-64.000.
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Agriculture: *See*—
Frank, Arlen W., 4,228,100, Cl. 260-551.00P.
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Nevin, Robert L., 4,228,435, Cl. 343-5.0SM.
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Menke, Joseph T., 4,227,976, Cl. 204-56.00M.
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Owen, Whitney H., 4,228,391, Cl. 322-35.000.
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Ito, Yoichiro, 4,228,009, Cl. 210-198.00C.
Mabie, Curtis P., 4,227,937, Cl. 106-313.000.
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Dusheck, George J., Jr.; and Scott, Phillips B., 4,228,395, Cl. 324-77.00B.
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McKechnie, John C., 4,227,401, Cl. 73-105.000.
Osborne, Scott R., 4,228,432, Cl. 340-736.000.
Park, Robert H.; Klas, Harold W.; and Estes, Nelson N., 4,227,476, Cl. 114-240.00A.
Schimitschek, Erhard J.; and Celto, John E., 4,228,408, Cl. 331-94.50G.
Shelton, J. Paul, 4,228,437, Cl. 343-909.000.
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Wheeler, John G., 4,227,711, Cl. 280-81.00R.
U.S. Philips Corporation: *See*—
Bluhm, Karl H.; and Kunath, Helfrid, 4,227,532, Cl. 128-328.000.
De Jager, Johan B.; and Noordanus, Johannes, 4,228,319, Cl. 179-2.0EB.
Duijkers, Peter A., 4,228,464, Cl. 358-165.000.
Thillays, Jacques-Claude, 4,228,490, Cl. 362-311.000.
Van Hemmen, Dirk J.; and Hoekstra, Albert, 4,227,301, Cl. 30-43.600.
van Straaten, Jan, 4,228,462, Cl. 358-158.000.
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Wouda, Kornelis J.; Giacometti, Alberto M.; and Riede, Willem, 4,228,409, Cl. 333-28.00R.
United Technologies Corporation: *See*—
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Vaillant, Christian; and Korcz, Eugene, to Fives-Cail Babcock. Vehicle unloading machine. 4,227,676, Cl. 254-277.000.
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van den Brom, Guido C., to Lever Brothers Company. Liquid detergent composition. 4,228,043, Cl. 252-529.000.
Vander Burgh, Lloyd A.; Moore, R. Dale; and Paplaski, Joseph, to International Harvester Company. Pivotable seat support. 4,227,670, Cl. 248-416.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N. V. Mowing machine. 4,227,365, Cl. 56-13.600.
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van der Stelt, Cornelis, to N.V. Koninklijke Pharmaceutische Fabrieken. Piperidinemethyl ethers. 4,228,287, Cl. 546-236.000.
Vanderwal, Frank E., Jr., to Sunnen Products Company. Heads for gaging devices and fixture for setting same. 4,227,310, Cl. 33-178.00R.
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van Gasse, Rene L. E., to Stamicarbon, B.V. Process for making objects from mineral fillers bonded with a thermosetting resin. 4,228,113, Cl. 264-24.000.
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van Straaten, Jan, to U.S. Philips Corporation. Line oscillator synchronizing circuit. 4,228,462, Cl. 358-158.000.
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Zorn, Milton J.; Slater, Edward L.; Maizner, Neil L.; Eccles, Brian J.; Minard, Hubert C.; Otsuki, Juko S.; and Sprengart, Daniel H., 4,227,786, Cl. 354-10.000.
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Volland, Michel F., to Saurer-Diederichs Societe Anonyme. Device for regulating the winding tension of woven fabric on a loom. 4,227,554, Cl. 139-310.000.
Von Drathen, Walter: *See*—
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VRL Growth Associates, Incorporated: *See*—
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Wachs, Marvin R.; and Berman, Arnold, to Communications Satellite Corporation. Communication satellite transponder interconnection utilizing variable bandpass filter. 4,228,401, Cl. 325-3.000.
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Wade, Lisby L.; Clarke, Donald L.; and Arrington, Jack P., to Dow Chemical Company, The. Method for the control of manure-breeding insects. 4,228,186, Cl. 424-327.000.
Wagner, Dennis L.: *See*—
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Waite, John C.; and Baber, David J., to Sperry Corporation. Multiplexed directory for dedicated cache memory system. 4,228,503, Cl. 364-200.000.
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Wakayama, Naoaki; Iida, Toshiyuki; and Yamagishi, Hideshi, to Japan Atomic Energy Research Institute. Method for shortening response time of logarithmic measuring apparatus. 4,228,355, Cl. 250-374.000.
Walden, Jack O. Energy management system. 4,228,364, Cl. 307-38.000.
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Wallace, Robert P. Drive mandrel for helical thread inserts. 4,227,290, Cl. 29-240.500.
Wallgren, Kurt; and Nilsson, Tage, to Mjolkcentralen Arlan, Ekonomisk Forening. Method of manufacture of low calorie margarine having a protein concentrate from skimmed milk. 4,228,190, Cl. 426-421.000.
Walling, James D.: *See*—
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Wang, Chih-Chung, to Kennecott Copper Corporation. Copper-boron carbide composite particle and method for its production. 4,227,928, Cl. 75-238.000.
Ward, Gary A.; and Winchell, David A., to Baxter Travenol Laboratories, Inc. Method for sealing container cap parts. 4,227,954, Cl. 156-250.000.
Wardlaw, Stephen C. Automatic disposable hypodermic syringe. 4,227,528, Cl. 128-218.00A.
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Warnow, Detlef; and Ziebrecht, Hans-Jorg, to Dragerwerk Aktiengesellschaft. Respirator for emergency air supply to a patient. 4,227,519, Cl. 128-205.240.
Warnow, Detlef; and Ziebrecht, Hans-Jorg, to Dragerwerk Aktiengesellschaft. Respirator construction. 4,227,523, Cl. 128-204.240.
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Wattin, Jean-Jacques, to Societe Anonyme Francaise du Ferodo. Air conditioning installation. 4,227,569, Cl. 165-35.000.

Wave Energy Development I Vastmanland Aktiebolag: *See—*
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Weaver, Merle L.; and Ng, Keng C., to United States of America, Agriculture. Process for preparing precooked potato products. 4,228,196, Cl. 426-407.000.

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Weems, Sterling J.; and McCurdy, Harold W., Jr., to Westinghouse Electric Corp. Hydrogen-oxygen recombiner. 4,228,132, Cl. 422-174.000.

"Wefoba" Werkzeug-und Formenbau Gesellschaft mbH & Co., KG: *See—*
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Weishew, Joseph F. Carriage reciprocator and positioner with continuously moving chain. 4,227,421, Cl. 74-27.000.

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Weiss, Roger E., to Bell Telephone Laboratories, Incorporated. Method and system for determining the wear of a drill bit in real time. 4,228,514, Cl. 364-551.000.

Weissmueller, William R., to Zenith Radio Corporation. Vertical synchronization system. 4,228,461, Cl. 358-148.000.

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Wells, Royzell F., to Martin Marietta Corporation. Axial tube cutter for severing electrical connector coupling rings. 4,227,431, Cl. 82-76.000.

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Wessel, Wolf; Stein, Volkhard; Sauer, Rudolf; and Kienzle, Wolfgang, to Robert Bosch GmbH. Fuel injection apparatus. 4,227,500, Cl. 123-455.000.

Wessel, Wolf, to Robert Bosch GmbH. Fuel supply system. 4,227,503, Cl. 123-454.000.

West, Jerry B., to Century Geophysical Corporation. Digital mineral logging system. 4,227,404, Cl. 73-151.000.

West, Jerry B., to Century Geophysical Corporation. Digital mineral logging system. 4,227,405, Cl. 73-151.000.

Westerlund, Allan G. Doorcatch. 4,227,727, Cl. 292-270.000.

Westermann, Donald H.; Sawicki, John E.; and Huige, Nicolaas J., to Jos. Schlitz Brewing Company. Method of mashing and lautering. 4,228,188, Cl. 426-11.000.

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Whitehill, Cassius F.; Whitehill, Robert D.; and Patel, Ghanshyam C., to Chicago Pneumatic Tool Company. Globoid-worm compressor with single piece housing. 4,227,867, Cl. 418-97.000.

Whitehill, Robert D.: *See—*
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Whittaker, Leonard B.; Clayton, William; Marriott, Eric W.; and Strong, Barry C., to William Cotton Limited. Straight bar knitting machines. 4,227,385, Cl. 66-82.00R.

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Wiggershaus, Fred; and Schafer, Felix, to Mannesmann Demag A.G. Wolfgang-Reuter-Platz. Hoist with two or more hoisting units. 4,227,679, Cl. 254-270.000.

Wiggins, Wayne T., to Standard Oil Company. Chemical etching of polymers for metallizing utilizing an aqueous sulfuric-carboxylic acid etchant. 4,227,963, Cl. 156-668.000.

Wight, Hewitt G.; Call, Tracey G.; and Mortensen, Marvin L., to California Polytechnic State University Foundation, The. Immunosuppressive m-fluorodithiocarbanilates. 4,228,182, Cl. 424-300.000.

Wilcock, Donald F., to Mechanical Technology Incorporated. Staged bearing surface compliance for hydrodynamic fluid bearing. 4,227,752, Cl. 308-9.000.

Wilcock, Donald F., to Mechanical Technology Incorporated. Compliant gas thrust bearing with profiled and apertured thrust runner. 4,227,753, Cl. 308-09.000.

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Bullock, David G.; Bunce, Roger A.; Clark, Ian R.; Duff, Ian D.; Greaves, Geoffrey S.; Lloyd, Peter H.; Peters, Ann M.; Whitehead, Thomas P.; and Wilding, Peter, 4,227,886, Cl. 23-230.00R.

Wilhelm, Gunter R., to R & Z Vermogensverwaltungsgesellschaft mbH. Peptide complexes of DNA-containing organisms. 4,228,068, Cl. 260-112.00R.

Wilkie, Arnold E.: *See—*
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William Cotton Limited: *See—*
Whittaker, Leonard B.; Clayton, William; Marriott, Eric W.; and Strong, Barry C., 4,227,385, Cl. 66-82.00R.

Williams, Alexander W.; and Kline, Harry A., to Borden, Inc. Electrodialysis of acid whey. 4,227,981, Cl. 204-180.00P.

Williams, George C., to Alden Research Foundation. Graphic electric recorder. 4,228,443, Cl. 346-165.000.

Williams, Ian G.: *See—*
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Williams, James E., to Wilson Research & Development Inc. Rotary food processing tool having offset hub. 4,227,655, Cl. 241-92.000.

Williams, Leonard E., Jr., to Cameron Iron Works, Inc. Blowout preventer. 4,227,543, Cl. 137-246.220.

Williams, Peter J., to Rolls-Royce Limited. Control systems for apparatus. 4,227,369, Cl. 60-734.000.
Williams, Reginald T.: *See—*
Hart, William B.; and Williams, Reginald T., 4,227,646, Cl. 236-93.00R.
Williamson, James; and Crete, Paul G., to Raytheon Company. Radar receiver local oscillator control circuit. 4,228,434, Cl. 343-5.0AF.
Williamson, Stanley C., to Oakite Products, Inc. No-rinse pre-paint coating composition and method. 4,227,946, Cl. 148-6.160.
Willis, W. Coy: *See—*
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Wirth Maschinen-und Bohrgerate-Fabrik: *See—*
Benjamin, Joseph R., 4,227,583, Cl. 175-65.000.
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Sorensen, Norman L., 4,227,739, Cl. 296-224.000.
Witek, Roman J., Jr., to International Telephone and Telegraph Corporation. Lamp socket structure. 4,227,760, Cl. 339-14.00R.
Wittenbreder, Eduard, to Droop & Rein, Firma; and Herr Dipl.-Ing. M. G. Dronsek. Tool-changing device. 4,227,296, Cl. 29-568.000.
Woinarski, Peter A. Method of connecting a bail to a container. 4,227,623, Cl. 220-91.000.
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Moe, Walter; Diker, Charles M.; and Wolf, Harley, 4,227,339, Cl. 46-123.000.
Wolfe, Paul G., to GTE Products Corporation. Constant luminance tint reference. 4,228,457, Cl. 358-21.00R.
Wolff, Robert, to Better Built Machinery Corporation. Door and seal construction for sterilizers. 4,228,135, Cl. 422-296.000.
Wong, John L., to Research Corporation. Polycyclic chlorinated hydrocarbons containing bridgehead or imino nitrogen. 4,228,078, Cl. 260-326.320.
Wood, Derek A.: *See—*
Mason, Ronald F.; and Wood, Derek A., 4,228,081, Cl. 260-326.620.
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Neale, Ronald G.; and Wood, Grady M., 4,228,524, Cl. 365-163.000.
Wood, Joseph L.; and Lipworth, Matthew F., to Olin Corporation. Process for cooling and drying chlorine gas. 4,227,890, Cl. 55-30.000.
Woodford, Alan T.; and Horellou, Michel R., to Spar Aerospace Limited. Manipulator wrist tool interface. 4,227,853, Cl. 414-738.000.
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Woods, Quentin T.; and Gerverdinck, William D., to FMC Corporation. Article taping system. 4,227,955, Cl. 156-269.000.
Workman, Harold W.; and Nicholas, David C., to Rockwell International Corporation. Dual TDM switching apparatus. 4,228,535, Cl. 370-16.000.
Worthington, Wayne H., to Worthington, Wayne H. Refuse collection device. 4,227,849, Cl. 414-408.000.
Wouda, Kornelis J.; Giacometti, Alberto M.; and Riede, Willem, to U.S. Philips Corporation. Transmission arrangement having an adjustable network. 4,228,409, Cl. 333-28.00R.
Wright, Robert L., to Monsanto Company. Effecting condensation of nitrohaloarene and formyl derivative of a primary aromatic amine with alkali metal hydroxide. 4,228,103, Cl. 260-576.000.
Wright, William J.: *See—*
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Wu, Wen-Li; and Black, William B., to Monsanto Company. Process for producing high tenacity polyethylene fibers. 4,228,118, Cl. 264-210.800.
Wunderlich, Ernst D.: *See—*
Rainville, Dewey; and Wunderlich, Ernst D., 4,227,871, Cl. 425-533.000.
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Yagi, Hisanori: *See—*
Murakami, Takeshi; Nakamura, Teruo; and Yagi, Hisanori, 4,228,222, Cl. 428-500.000.
Yagi, Sumio: *See—*
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Yagi, Toshiro; Yamamoto, Junichi; and Kohara, Hideo, to Toyo Kogyo Co., Ltd. Method of forming aluminum coating layer on ferrous base alloy workpiece. 4,228,203, Cl. 427-229.000.
Yagihara, Morio; and Yokota, Yukio, to Fuji Photo Film Co., Ltd. Photographic silver halide light-sensitive material. 4,228,233, Cl. 430-385.000.
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, to Nippon Chemiphar Company, Limited. Benzo[b,f]thiepan derkvktives. 4,228,284, Cl. 544-375.000.
Yamada, Osamu: *See—*
Takahashi, Tatsuo; and Yamada, Osamu, 4,228,454, Cl. 357-61.000.
Yamada, Toshiro: *See—*
Himuro, Masami; Yamada, Toshiro; and Makino, Yoshimi, 4,228,473, Cl. 360-114.000.
Yamaga, Eiichi: *See—*
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Yamamoto, Akira; Iida, Masaru; Miyake, Satoru; Yamaura, Hideo; and Inoue, Takeshi, to Nissan Chemical Industries, Limited. Suspension polymerization of vinyl chloride using hydroxyacrylic polymers. 4,228,264, Cl. 526-200.000.
Yamamoto Electric Industries, Ltd.: *See—*
Soeda, Katsuji; Oyama, Mitsuhiro; Sakuma, Fumio; and Nakajima, Tadashi, 4,228,383, Cl. 318-245.000.
Yamamoto, Junichi: *See—*
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Yamamoto, Michihiro; Koshiba, Masao; and Aono, Shunji, to Sumitomo Chemical Company, Limited. Diuretic and vasodilating tricyclic quinazolines. 4,228,167, Cl. 424-251.000.
Yamanaka, Toru: *See—*
Yamabe, Shigeru; Fujimoto, Yasuo; Ryu, Shoji; Suzuki, Yoshio; Tanaka, Yoshihiro; Yamanaka, Toru; and Nyu, Kiyosato, 4,228,284, Cl. 544-375.000.
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Yamauchi, Kiaki; Morimoto, Yukihiko; Sasaki, Toshikatu; and Nakai, Katsumi, to Osaka Gas Company, Limited. Method for reactivation of platinum group metal catalyst with aqueous alkaline and/or reducing solutions. 4,228,033, Cl. 252-412.000.
Yamauchi, Toshiro; Saito, Takemi; and Kanayama, Shigehiro, to Fuji Photo Optical Co., Ltd. Optical color-separation system for use in a color television camera. 4,228,458, Cl. 358-55.000.
Yamaura, Hideo: *See—*
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Yara Engineering Corporation: *See—*
Chapman, John H.; and Anderson, David, 4,227,920, Cl. 75-1.00R.
Yard, John S.: *See—*
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Yasuda, Nobuaki; Ogawa, Takenobu; and Sadamasa, Tetsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Gallium phosphide semiconductor device having improved electrodes. 4,228,455, Cl. 357-67.000.
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Yokota, Yukio: *See—*
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Yonker, John H.: *See*—
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Yoshida, Isao: *See*—
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Yoshida, Kobun: *See*—
Magata, Yoshihiro; Yoshida, Kobun; and Kato, Itsuo, 4,228,472, Cl. 360-73.000.

Yoshida Kogyo K.K.: *See*—
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Yoshida, Yoshinori; and Shinohara, Hironobu, to Japan Synthetic Rubber Co., Ltd. Process for the preparation of diacetoxybutene. 4,228,301, Cl. 560-244.000.

Yoshihara, Ichiro: *See*—
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Young, Claude A. Can edge riding can opener. 4,227,473, Cl. 113-1.00K.

Youngstown Sheet and Tube Company: *See*—
Maguire, Keith D.; and Currieo, Royce A., 4,227,891, Cl. 55-85.000.

Yuasa, Yoshio, to Minolta Camera Kabushiki Kaisha. Digital light measuring device. 4,227,808, Cl. 356-218.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Gierer, Georg, 4,227,597, Cl. 192-3.330.

Zaluski, John. Auxiliary lock assembly. 4,227,728, Cl. 292-297.000.

Zandberg, Yoel, to Laser Industries Ltd. Mechanical control system particularly useful for directing a laser beam. 4,228,341, Cl. 219-121.00L.

Zebra Co., Ltd.: *See*—
Kokubu, Teruo, 4,227,822, Cl. 401-17.000.

Zebroski, Edwin L., to Electric Power Research Institute, Inc. Method and apparatus for reducing the power level in a nuclear reactor during temperature transient. 4,227,967, Cl. 176-36.00R.

Zelahy, John W.: *See*—
Stalker, Kenneth W.; Zelahy, John W.; and Fairbanks, Norman P., 4,227,703, Cl. 277-53.000.

Zelinger, Jiri: *See*—
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Zenith Radio Corporation: *See*—
Weissmueller, William R., 4,228,461, Cl. 358-148.000.

Zernig, Ernst, to Richard Heinze GmbH & Co. KG, Firma. Base or adjustment plate for cabinet hinges. 4,227,284, Cl. 16-129.000.

Zewail, Ahmed H.; and Batchelder, J. Samuel, to California Institute of Technology. Luminescent solar energy concentrator devices. 4,227,939, Cl. 136-247.000.

Zichis, Joseph, deceased; and Zichis, Lillian K., executrix. Heterophil antibody differentiation (HAD) test. 4,228,148, Cl. 424-12.000.

Zichis, Lillian K., executrix: *See*—
Zichis, Joseph, deceased; and Zichis, Lillian K., executrix, 4,228,148, Cl. 424-12.000.

Zidele, Israel. Reversible baseball glove. 4,227,263, Cl. 2-19.000.

Ziebrecht, Hans-Jorg: *See*—
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Warnow, Detlef; and Ziebrecht, Hans-Jorg, 4,227,523, Cl. 128-204.240.

Zifferer, Morton F.; and Flinchbaugh, Donald E., to Mordo Company. Throttle synchronizer for internal combustion engines. 4,227,428, Cl. 74-526.000.

Zikopoulos, John N.: *See*—
Robyt, John F.; and Zikopoulos, John N., 4,228,150, Cl. 424-48.000.

Zilic, Charles: *See*—
Stratynski, Eugene; and Zilic, Charles, 4,227,412, Cl. 73-368.300.

Zilling, Helmut: *See*—
Augsburger, Rolf; Kuppka, Horst; and Zilling, Helmut, 4,227,545, Cl. 137-340.000.

Zimmerman, Dennis M., to Eli Lilly and Company. Certain substituted 3,4,5,6-tetrahydropyridinium salt intermediates. 4,228,288, Cl. 546-339.000.

Zimmerman, George M., to Bon Aqua, Inc. Magnetic fluid treating unit. 4,228,010, Cl. 210-222.000.

Zimmerman, Robert L., to Texaco Development Corp. Morpholine derivatives and use as polyurethane catalyst. 4,228,248, Cl. 521-115.000.

Zimmerman, Robert L.: *See*—
Speranza, George P.; Zimmerman, Robert L.; and Austin, Thomas H., 4,228,310, Cl. 568-620.000.

Zimmerschied, Wilford J., to Standard Oil Company (Indiana). Bromine removal from acetic acid. 4,227,971, Cl. 203-32.000.

Zimmerschied, Wilford J., to Standard Oil Company (Indiana). Removal of bromine from acetic acid. 4,228,307, Cl. 562-608.000.

Zink, John S.; and Reed, Robert D., to John Zink Company. Apparatus for supplying alternate gases to steam injection means on a flare stack. 4,227,872, Cl. 431-90.000.

Zinko, Heimo: *See*—
Margen, Peter H. E.; Roseen, Rutger A.; and Zinko, Heimo, 4,227,511, Cl. 126-415.000.

Zinser Textilmaschinen GmbH: *See*—
Kriechbaum, Kurt; Kienhofer, Hans; and Picht, Rin J., 4,227,848, Cl. 414-395.000.

Zipper, Donald H., to Continental Group, Inc., The. Expansion section for tamper-indicating ring of squeeze-off closure. 4,227,618, Cl. 215-253.000.

Zoecon Corporation: *See*—
Carney, Robert L.; and Henrick, Clive A., 4,228,093, Cl. 556-482.000.

Zorn, Milton J.; Slater, Edward L.; Maizner, Neil L.; Eccles, Brian J.; Minard, Hubert C.; Otsuki, Juko S.; and Sprengart, Daniel H., to Visual Graphics Corporation. Photoprinting apparatus employing base line control imaging font. 4,227,786, Cl. 354-10.000.

Zysmann, Alexandre: *See*—
Kalopissis, Gregoire; Zysmann, Alexandre; Sebag, Henri; Vanlerberghe, Guy; Huron, Jean-Louis; and Bugaut, Andree, 4,228,259, Cl. 525-435.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14TH DAY OF OCTOBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Rand, Earl W., Jr. Fuel saving apparatus for multiple cylinder internal combustion engines. Re. 30,417, Cl. 123-198.00F.

LIST OF DESIGN PATENTEES

Abbott Laboratories: *See*—
Reichler, Allen S., 257,394, Cl. D24-56.000.

Aboussouan, Michel F. Tape cartridge holder. 257,306, 10-14-80, Cl. D6-185.000.

Abrahamson, Oliver D.: *See*—
Robison, John L.; and Abrahamson, Oliver D., 257,314, Cl. D7-70.000.

Akazawa, Toshimasa; Fujimoto, Munenori; Ohta, Kikuo; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 257,351, 10-14-80, Cl. D14-68.000.

American Optical Corporation: *See*—
Armbruster, John T., 257,357, Cl. D16-58.000.
Armbruster, John T., 257,358, Cl. D16-58.000.

Andrews, Del. Hexagonal floating live bait container. 257,377, 10-14-80, Cl. D22-22.000.

Andrews, Del. Floating live bait container. 257,378, 10-14-80, Cl. D22-22.000.

Antos, John M.: *See*—
Sargent, Frank T.; Antos, John M.; Henke, Arthur W.; and Hoffman, John A., 257,385, Cl. D23-48.000.

Antretter, Richard; and Siersch, Werner, to Rian-Apparate - und Vorrichtungsbau GmbH. Shaver. 257,401, 10-14-80, Cl. D28-49.000.

Armbruster, John T., to American Optical Corporation. Body of a tissue culture microscope. 257,357, 10-14-80, Cl. D16-58.000.

Armbruster, John T., to American Optical Corporation. Body and illuminator of a tissue culture microscope. 257,358, 10-14-80, Cl. D16-58.000.

Astatic Corporation, The: *See*—
Garrigus, Charles R.; Over, Gary L.; and Cvetko, Henry J., 257,346, Cl. D14-12.000.

Astrosystems, Inc.: *See*—
Barth, Seymour, 257,344, Cl. D13-32.000.

Barth, Seymour, to Astrosystems, Inc. Limit set module. 257,344, 10-14-80, Cl. D13-32.000.

Bausch & Lomb Incorporated: *See*—
Jordan, Paul A., 257,388, Cl. D24-17.000.

Benjamin, E. Burton, to Mosinee Paper Corporation. Towel dispensing cabinet. 257,302, 10-14-80, Cl. D6-96.000.

Black, Warren M., to Merriman Holbrook, Inc. Toe-rail. 257,337, 10-14-80, Cl. D12-70.000.

Blaser, Steffan E. License plate holder. 257,341, 10-14-80, Cl. D12-193.000.

Bogan, David B. Toilet riser. 257,386, 10-14-80, Cl. D23-69.000.

Breneman, Jack L., to Quaker Oats Company, The. Toy tow truck body. 257,368, 10-14-80, Cl. D21-139.000.

Brumbt, Joe. Ski scooter. 257,336, 10-14-80, Cl. D12-8.000.

Burdock, Patrick T. A., to Rovex Limited. Toy ambulance. 257,367, 10-14-80, Cl. D21-134.000.

Chapman, Darwin E., to Creative Phototronics, Inc. Motorized base for use in developing photographic prints. 257,355, 10-14-80, Cl. D16-33.000.

Collins, James; and Gerstenbacher, Joseph. Aerial toy. 257,363, 10-14-80, Cl. D21-86.000.

Computer Products Corporation: *See*—
Thomas, Ronald B., 257,349, Cl. D14-40.000.

Cone, Richard E., to Questor Corporation. Playpen. 257,299, 10-14-80, Cl. D6-13.000.

Conti, Rino, to Dart Industries Inc. Cream pitcher or the like. 257,312, 10-14-80, Cl. D7-64.000.

Correll, William L. Sawhorse. 257,395, 10-14-80, Cl. D25-67.000.

Cosmopulos, Stavros. Food plate or similar article. 257,310, 10-14-80, Cl. D7-1.000.

Creative Phototronics, Inc.: *See*—
Chapman, Darwin E., 257,355, Cl. D16-33.000.

Cremer, Richard T. Set of socket wrench extensions. 257,319, 10-14-80, Cl. D8-29.000.

Cunningham, Bette. Mascara application aid. 257,400, 10-14-80, Cl. D28-7.000.

Cvetko, Henry J.: *See*—
Garrigus, Charles R.; Over, Gary L.; and Cvetko, Henry J., 257,346, Cl. D14-12.000.

Daiwa Seiko, Inc.: *See*—
Nakamura, Hideo, 257,379, Cl. D22-23.000.
Nakamura, Hideo, 257,380, Cl. D22-23.000.

Dart Industries Inc.: *See*—
Conti, Rino, 257,312, Cl. D7-64.000.
Painter, David L.; and Zinkgraf, Robert C., 257,311, Cl. D7-64.000.
Painter, David L.; and Zinkgraf, Robert C., 257,313, Cl. D7-65.000.

Davco Fishing Products: *See*—
Davenport, Betty B., 257,383, Cl. D22-31.000.

Davenport, Betty B., to Davco Fishing Products. Fisherman's tool. 257,383, 10-14-80, Cl. D22-31.000.

Denton, David H.; and Purdom, David D. Dental floss dispenser. 257,402, 10-14-80, Cl. D28-64.000.

Drevitch, Nolan A.: *See*—
Young, Warren H.; Drevitch, Nolan A.; and Rosati, Anthony G., 257,356, Cl. D16-42.000.

Dulude, Charles R. Gun target. 257,376, 10-14-80, Cl. D22-15.000.

Ellinwood, Paul. Windshield wiper unit. 257,339, 10-14-80, Cl. D12-155.000.

English, Michael D. Table top. 257,308, 10-14-80, Cl. D6-192.000.

Fairchild Industries, Inc.: *See*—
McComas, Jean W.; and Rosenthal, Gordon, 257,338, Cl. D12-78.000.

Fish, Darrell D., to Universal Security Instruments, Inc. Portable tire inflating unit. 257,354, 10-14-80, Cl. D15-9.000.

Fisher, Morris F., to Futorian Corporation. Sofa. 257,300, 10-14-80, Cl. D6-63.000.

Flo-Pac Corporation: *See*—
Pichelman, Franklin D.; and Mehl, Donald N., 257,322, Cl. D8-354.000.

Fogolin, Fiorevante. Outboard motor protector. 257,353, 10-14-80, Cl. D15-4.000.

Fujimoto, Munenori: *See*—
Akazawa, Toshimasa; Fujimoto, Munenori; Ohta, Kikuo; and Mishiro, Benito, 257,351, Cl. D14-68.000.

Futorian Corporation: *See*—
Fisher, Morris F., 257,300, Cl. D6-63.000.

Gabriel, Richard J., to Matrix Toys. Joint element for construction set. 257,365, 10-14-80, Cl. D21-108.000.

Gabriel, Richard J., to Matrix Toys. Joint element for construction set. 257,366, 10-14-80, Cl. D21-108.000.

Gammon, Samuel L. Cardio compressor. 257,391, 10-14-80, Cl. D24-36.000.

Garrigus, Charles R.; Over, Gary L.; and Cvetko, Henry J., to Astatic Corporation, The. Conference microphone. 257,346, 10-14-80, Cl. D14-12.000.

Genal Strap, Inc.: *See*—
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256 4,227,477
4,227,478
312 4,227,479

CLASS 116

142 FP 4,227,482

CLASS 118

411 4,227,483
502 4,227,484

CLASS 119

16 4,227,485
28 4,227,486
29 4,227,487

CLASS 122

4 D 4,227,488
457 4,227,489

CLASS 123

59 B 4,227,492
90.16 4,227,494
90.3 4,227,493
90.55 4,227,495
198 F Re.30,417
4,227,505
227 4,227,506
380 4,227,504
440 4,227,496
453 4,227,501
454 4,227,502
4,227,503
455 4,227,500
488 4,227,491
492 4,227,490
4,227,507
499 4,227,499
501 4,227,498
525 4,227,497

CLASS 124

16 4,227,508
23 R 4,227,509

CLASS 126

25 B 4,227,510
415 4,227,511
420 4,227,512
425 4,227,513
426 4,227,514
427 4,227,515

CLASS 128

1 C 4,227,516
91 A 4,227,517
92 BC 4,227,518
201.24 4,227,520
202.14 4,227,521
203.15 4,227,522
204.24 4,227,523
205.24 4,227,519
205.26 4,227,524
214 E 4,227,526
214 R 4,227,525
4,227,527
218 A 4,227,528
276 4,227,529
287 4,227,530
288 4,227,531
328 4,227,532
349 B 4,227,534
349 BV 4,227,533
401 4,227,535
479 4,227,536
756 4,227,537

CLASS 130

30 C 4,227,538

CLASS 131

138 4,227,539
187 4,227,540

CLASS 132

37 R 4,227,541

CLASS 134

10 4,227,938

CLASS 135

4 R 4,227,542

CLASS 136

247 4,227,939
255 4,227,941
4,227,942
4,227,943
256 4,227,940
4,228,315

CLASS 137

246.22 4,227,543
307 4,227,544
340 4,227,545
387 4,227,546
554 4,227,547
606 4,227,548
625.69 4,227,549
835 4,227,550

CLASS 138

40 4,227,551

CLASS 139

1 C 4,227,552
82 4,227,553
310 4,227,554
384 B 4,227,555

CLASS 141

137 4,227,556

CLASS 142

7 4,227,557

CLASS 144

2 R 4,227,558

CLASS 148

6 4,227,944
4,227,945
6.16 4,227,946
122 4,227,947
175 4,227,948

CLASS 150

1.5 R 4,227,559

CLASS 151

24 4,227,560
41.74 4,227,561

CLASS 152

214 4,227,562
354 R 4,227,563

CLASS 156

73.5 4,227,949
85 4,227,950
158 4,227,951
164 4,227,952
227 4,227,953
250 4,227,954
269 4,227,955
334 4,227,956
443 4,227,957
4,227,958
515 4,227,959
519 4,227,960
608 4,227,961
624 4,227,962
668 4,227,963

CLASS 160

345 4,227,564

CLASS 162

9 4,227,964
13 4,227,965
36 4,227,966

CLASS 164

155 4,227,565

CLASS 165

1 4,227,566
4,227,567
4,227,568
8 4,227,569
35 4,227,570
67 4,227,571
167 4,227,572
184

CLASS 166

153 4,227,573
259 4,227,574
303 4,227,575
312 4,227,576

CLASS 169

61 4,227,577

CLASS 172

40 4,227,578
64 4,227,579
112 4,227,580
142 4,227,581

CLASS 174

45 R 4,228,316
67 4,228,317
73 R 4,228,318

CLASS 175

16 4,227,582
65 4,227,583
95 4,227,584
325 4,227,585
346 4,227,586

CLASS 176

36 R 4,227,967
87 4,227,968

CLASS 179

1 VL 4,228,402
1.5 S 4,228,321
2 EA 4,228,320
2 EB 4,228,319
15.55 T 4,228,322
16 F 4,228,323
99 H 4,228,324
100 R 4,228,325
100.1 G 4,228,326
115.5 ES 4,228,327
175.2 R 4,228,328

CLASS 180

165 4,227,587
167 4,227,588
206 4,227,589

CLASS 181

175 4,227,590
230 4,227,591

CLASS 187

56 4,227,592

CLASS 188

1 C 4,227,593
361 4,227,594

CLASS 191

2 4,227,595
23 A 4,227,596

CLASS 192

3.33 4,227,597
4 A 4,227,598
54 4,227,599
84 C 4,227,600
105 BA 4,227,601
109 F 4,227,602
111 A 4,227,603

CLASS 194

102 4,227,604

CLASS 196

115 4,227,969

CLASS 198

331 4,227,605
459 4,227,606
460 4,227,607
630 4,227,608
711 4,227,609
831 4,227,610

CLASS 200

5 A 4,228,329
4,228,330
144 R 4,228,331
148 R 4,228,332
4,228,333

CLASS 202

234 4,227,970

CLASS 203

32 4,227,971
37 4,227,972

CLASS 204

1 T 4,227,973
4,227,974
15 4,227,975
56 M 4,227,976
129 4,227,977
159.12 4,227,978
159.16 4,227,979
159.23 4,227,980
180 P 4,227,981
181 C 4,227,982
195 S 4,227,984
196 4,227,985
209 4,227,986
228 4,227,987
231 4,227,988

CLASS 206

219 4,227,611
4,227,612
459 4,227,613
4,227,614

CLASS 208

8 LE 4,227,989
4,227,991
8 R 4,227,990
46 4,227,992
139 4,227,993
177 4,227,994
251 H 4,227,995

CLASS 209

12 4,227,996
250 4,227,997

CLASS 210

167 4,228,006
198 C 4,228,007
4,228,008
4,228,009
207 4,228,005
222 4,228,010
232 4,228,011
238 4,228,012
264 4,228,013
321 R 4,228,014
4,228,015
609 4,227,998
650 4,227,999
673 4,228,000
676 4,228,001
725 4,228,003
729 4,228,002
739 4,228,004

CLASS 215

222 4,227,615
246 4,227,616
251 4,227,617
253 4,227,618
255 4,227,619
355 4,227,620

CLASS 217

96 4,227,621

CLASS 219

10.55 E 4,228,334
56 4,228,335
73.1 4,228,336
4,228,337
76.13 4,228,338
77 4,228,339
113 4,228,340
121 L 4,228,341
137 WM 4,228,342
225 4,228,343
270 4,228,344
388 4,228,345

CLASS 220

4 B 4,227,622
91 4,227,623
265 4,227,624
307 4,227,625

CLASS 221

188 4,227,626

CLASS 222

282 4,227,627
380 4,227,628
566 4,227,629
600 4,227,630
635 4,227,631

CLASS 223

94 4,227,632

CLASS 224

42.28 4,227,633
42.45 R 4,227,634

CLASS 225

96.5 4,227,635

CLASS 226

189 4,227,636

CLASS 227

8 4,227,637
155 4,227,638

CLASS 228

173 F 4,227,639

CLASS 229

41 C 4,227,640
42 4,227,641
52 AW 4,227,642

CLASS 235

54 F 4,227,643
92 C 4,228,347
92 T 4,228,346
433 4,227,644
449 4,228,348

CLASS 236

49 4,227,645
93 R 4,227,646

CLASS 237

2 B 4,227,647

CLASS 239

11 4,227,648
124 4,227,649
333 4,227,650
428 4,227,651
706 4,227,652

CLASS 241

24 4,227,653
34 4,227,654
92 4,227,655
93 4,227,656

CLASS 242

47.01 4,227,657
66 4,227,658
84.1 R 4,227,659
86.52 4,227,660
107.7 4,227,661

CLASS 244

76 C 4,227,662
149 4,227,663
194 4,227,664
210 4,227,665

CLASS 246

187 C 4,227,666

CLASS 248

229 4,227,667
317 4,227,668
4,227,669
416 4,227,670
480 4,227,671

CLASS 249

28 4,227,672
117 4,227,673

CLASS 250

226 4,228,349
267 4,228,350
273 4,228,351
343 4,228,352
356 4,228,353
371 4,228,354
374 4,228,355
439 P 4,228,356
445 T 4,228,357
457 4,228,358

CLASS 251

15 4,227,674
173 4,227,675

CLASS 252

8.55 D 4,228,016
4,228,017
4,228,018
4,228,019
29 4,228,020
32.7 R 4,228,021
42.7 4,228,022
63 4,228,023
4,228,024
99 4,228,025
174.11 4,228,026
174.19 4,228,027
188.3 R 4,228,028
299 4,228,029
4,228,030
316 4,228,031
400 R 4,228,032
412 4,228,033
430 4,228,034
431 R 4,228,035
437 4,228,036
444 4,228,037
461 4,228,038
462 4,228,039
475 4,228,040
528 4,228,042
529 4,228,043
547 4,228,044

CLASS 254

264 4,227,677
270 4,227,679
277 4,227,676
344 4,227,680
391 4,227,678

CLASS 260

4 R 4,228,045
5 4,228,046
17.4 ST 4,228,047
17.4 UC 4,228,048
21 4,228,049
23 XA 4,228,050
23.7 R 4,228,051
28.5 AS 4,228,052
29.2 M 4,228,054
29.2 TN 4,228,053
29.3 4,228,055
29.6 AN 4,228,056
29.6 TA 4,228,057
29.7 UA 4,228,058
30.2 4,228,059
30.4 R 4,228,060
31.2 R 4,228,061
42.28 4,228,062
45.7 P 4,228,063
4,228,064
45.75 C 4,228,066
45.8 N 4,228,065
45.85 V 4,228,067
112 R 4,228,068
143 4,228,069
152 4,228,070
153 4,228,071
156 4,228,072
176 4,228,073
239 A 4,228,074
243.3 4,228,075
326.14 T 4,228,077
326.32 4,228,078
326.62 4,228,081
343.41 4,228,079
345.9 R 4,228,080
347.3 4,228,082
347.8 4,228,083
348.12 4,228,084
348.49 4,228,085
349 4,228,086
408 4,228,087
409 4,228,088
428.5 4,228,089
429 R 4,228,090
439 R 4,228,091
450 4,228,094
453 AM 4,228,095
459 A 4,228,096
465 F 4,228,097
465.3 4,228,098
501.11 4,228,099
551 P 4,228,100
561 HL 4,228,101
561 N 4,228,102
576 4,228,103
928 4,228,108
941 4,228,109

CLASS 261

37 4,228,110
44 C 4,228,111
87 4,228,112

CLASS 264

24 4,228,113
33 4,228,114
46.4 4,228,115
119 4,228,116
176 F 4,228,117
210.8 4,228,118
211 4,228,119
235.6 4,228,120
291 4,228,121
321 4,228,076
534 4,228,122
557 4,228,123

CLASS 266

170 4,227,681
271 4,227,682

CLASS 270

61 F 4,227,683
67 4,227,684

CLASS 271

13 4,227,685
95 4,227,686
139 4,227,687

CLASS 272

62 4,227,688
130 4,227,689

CLASS 273

1 R 4,227,690
26 R 4,227,691
67 R 4,227,692
86 C 4,227,693
164 4,227,694
255 4,227,695
260 4,227,696
272 4,227,697
309 4,227,698

CLASS 274

13 R 4,227,699

CLASS 277

12 4,227,700
4,227,701
34.3 4,227,702
53 4,227,703
84 4,227,704
160 4,227,705

CLASS 280

3 4,227,706
47.11 4,227,709
47.19 4,227,710
81 R 4,227,711
236 4,227,712
434 4,227,713
605 4,227,714
618 4,227,715
719 4,227,716
753 4,227,717
770 4,227,718
809 4,227,708
814 4,227,707

CLASS 283

8 R 4,227,719
4,227,720

CLASS 285

18 4,227,721
56 4,227,722

CLASS 290

40 R 4,228,359
43 4,228,360
44 4,228,361
4,228,362
4,228,363

CLASS 292

34 4,227,723
145 4,227,724
202 4,227,725
251.5 4,227,726
270 4,227,727
297 4,227,728

CLASS 293

145 4,227,729

CLASS 294

16 4,227,730
17 4,227,731
71 4,227,732
83 R 4,227,733

CLASS 296

24 R 4,227,735
65 R 4,227,736
76 4,227,737
224 4,227,738
4,227,739

CLASS 297

310 4,227,740
362 4,227,741
430 4,227,742

CLASS 299

2 4,227,743
94 4,227,744

CLASS 300

2 4,227,745

CLASS 303

6 R 4,227,746
24 C 4,227,747

CLASS 305

10 4,227,748
30 4,227,749

CLASS 307

38 4,228,364
221 D 4,228,365
229 4,228,366
251 4,228,367
262 4,228,368
270 4,228,369
291 4,228,370
317 A 4,228,371

CLASS 308

3.8 4,227,750
6 C 4,227,751
9 4,227,752
09 4,227,753
177 4,227,754
184 R 4,227,755
241 4,227,756

CLASS 310

13 4,228,372
20 4,228,373
53 4,228,374
214 4,228,375
242 4,228,376
263 4,228,377
268 4,228,378
322 4,228,379

CLASS 312

97 4,227,757
107 4,227,758
257 R 4,227,759

CLASS 315

111.4 4,228,380
151 4,228,381
219 4,228,382

CLASS 318

245 4,228,383
254 4,228,384
614 4,228,385
628 4,228,386
696 4,228,387
770 4,228,388

CLASS 320

2 4,228,389
38 4,228,390

CLASS 322

35 4,228,391

CLASS 324

61 R 4,228,392
4,228,393
62 4,228,394
77 B 4,228,395
163 4,228,396
179 4,228,397
418 4,228,398
425 4,228,399
450 4,228,400

CLASS 325

3 4,228,401

CLASS 328

15 4,228,403

CLASS 330

267 4,228,404

CLASS 331

65 4,228,405
94.5 D 4,228,406
94.5 G 4,228,408
94.5 P 4,228,407

CLASS 333

28 R 4,228,409
122 4,228,410
218 4,228,411

CLASS 335

152 4,228,412
213 4,228,413
4,228,414
255 4,228,415
295 4,228,416

CLASS 337

252 4,228,417

CLASS 338

195 4,228,418

CLASS 339

14 R 4,227,760
66 M 4,227,761
91 R 4,227,762
99 R 4,227,763
121 4,227,764
143 R 4,227,765
147 R 4,227,766
176 MF 4,227,767
198 H 4,227,768

CLASS 340

32 4,228,419
146.3 F 4,228,420
146.3 MA 4,228,421
310 A 4,228,422
347 CC 4,228,423
506 4,228,424
550 4,228,425

573 4,228,426
623 4,228,427
628 4,228,428
632 4,228,429
709 4,228,430
719 4,228,431
736 4,228,432
748 4,228,433

CLASS 343

5 AF 4,228,434
5 SM 4,228,435
854 4,228,436
909 4,228,437

CLASS 346

1.1 4,228,438
33 R 4,228,439
75 4,228,440
139 C 4,228,441
140 R 4,228,442
165 4,228,443

CLASS 350

96.19 4,227,769
96.23 4,227,770
96.33 4,227,771
103 4,227,772
175 ML 4,227,773
263 4,227,774
267 4,227,775
285 4,227,776
334 4,227,777
350 R 4,227,778
357 4,227,779

CLASS 351

7 4,227,780

CLASS 352

41 4,227,781
82 4,227,782
194 4,227,783
244 4,227,784

CLASS 353

50 4,227,785

CLASS 354

10 4,227,786
51 4,227,787
60 R 4,227,788
86 4,227,789
195 4,227,790
196 4,227,791
230 4,227,792
246 4,227,793
299 4,227,794

CLASS 355

3 DD 4,227,796
3 R 4,227,795
10 4,227,797
14 C 4,227,798
27 4,227,799
50 4,227,803
67 4,227,804
72 4,227,800
75 4,227,801

CLASS 356

5 4,227,802
71 4,227,805
73.1 4,227,806
152 4,227,807
218 4,227,808
237 4,227,809
246 4,227,810
325 4,227,811
372 4,227,812
4,227,813
410 4,227,814
436 4,227,815

CLASS 357

22 4,228,444
24 4,228,445
30 4,228,449
31 4,228,446
42 4,228,447
46 4,228,448
51 4,228,450
4,228,451
59 4,228,452
60 4,228,453
61 4,228,454
67 4,228,455

CLASS 358

20 4,228,456
21 R 4,228,457
55 4,228,458
112 4,228,459
127 4,228,460
148 4,228,461
158 4,228,462
4,228,463
165 4,228,464
166 4,228,465
257 4,228,466
261 4,228,467
280 4,228,468
288 4,228,469

CLASS 360

12 4,228,470
73 4,228,471
4,228,472
114 4,228,473
137 4,228,474

CLASS 361

47 4,228,475
68 4,228,476
87 4,228,477
128 4,228,478
218 4,228,479
235 4,228,480
314 4,228,481
321 4,228,482
393 4,228,483

CLASS 362

184 4,228,484
191 4,228,485
237 4,228,486
240 4,228,487
250 4,228,488
4,228,489
311 4,228,490

CLASS 363

41 4,228,491
48 4,228,492
56 4,228,493
85 4,228,494

CLASS 364

101 4,228,495
200 4,228,496
4,228,497
4,228,498
4,228,499
4,228,500
4,228,501
4,228,502
4,228,503
4,228,504
414 4,228,505
415 4,228,506
419 4,228,507
420 4,228,508
501 4,228,509
506 4,228,511
521 4,228,510
527 4,228,512
550 4,228,513
551 4,228,514
571 4,228,515
602 4,228,516
724 4,228,517
759 4,228,518
760 4,228,520
900 4,228,519

CLASS 365

4 4,228,521
15 4,228,522
19 4,228,523
163 4,228,524
174 4,228,525
183 4,228,526
185 4,228,527
200 4,228,528

CLASS 366

99 4,227,816
127 4,227,817
142 4,227,818

CLASS 367

70 4,228,529
112 4,228,530
135 4,228,531
159 4,228,532

CLASS 368

134 4,228,533
224 4,228,534

CLASS 370

16 4,228,535
66 4,228,536

CLASS 371

23 4,228,537

CLASS 400

56 4,227,819
195 4,227,820
616.3 4,227,821

CLASS 401

17 4,227,822
99 4,227,823

CLASS 403

271 4,227,824
322 4,227,825
371 4,227,826

CLASS 404

121 4,227,827

CLASS 405

1 4,227,828
20 4,227,829
195 4,227,830
196 4,227,831
215 4,227,832
299 4,227,833
303 4,227,834

CLASS 406

52 4,227,835
114 4,227,836

CLASS 407

53 4,227,837
77 4,227,838

CLASS 408

16 4,227,839
20 4,227,840
197 4,227,841

CLASS 409

131 4,227,842

CLASS 410

12 4,227,734
54 4,227,843

CLASS 414

24.5 4,227,844
39 4,227,845
139 4,227,846
152 4,227,847
395 4,227,848
408 4,227,849
620 4,227,850
626 4,227,851
694 4,227,852
738 4,227,853
746 4,227,854

CLASS 415

215 4,227,855

CLASS 416

1 4,227,856
134 A 4,227,857
4,227,858
4,227,859
155 4,227,860
169 A 4,227,861
186 R 4,227,868

CLASS 417

12 4,227,862
169 4,227,863
269 4,227,864
365 4,227,865
379 4,227,866

CLASS 418

97 4,227,867
206 4,227,869

CLASS 422

36 4,228,124
46 4,228,125
56 4,228,126
61 4,228,127
98 4,228,128
102 4,228,129
131 4,228,130
156 4,228,131
174 4,228,132
195 4,228,133
208 4,228,134
296 4,228,135
307 4,228,136

CLASS 423

118 4,228,137
239 4,228,138
242 4,228,139
320 4,228,140
415 A 4,228,141
445 4,228,143
449 4,228,142
498 4,228,144
644 4,228,145

CLASS 424

1 4,228,146
9 4,228,147
12 4,228,148
14 4,228,149
48 4,228,150
60 4,228,151
81 4,228,152
95 4,228,153
101 4,228,154
175 4,228,159
177 4,228,155
4,228,156
4,228,157
4,228,158
180 4,228,160
232 4,228,161
4,228,162
240 4,228,163
246 4,228,164
248.5 4,228,165
250 4,228,166
251 4,228,167
256 4,228,168
258 4,228,169
4,228,170
263 4,228,171
4,228,172
269 4,228,173
272 4,228,174
273 R 4,228,175
4,228,176
4,228,177
274 4,228,178
4,228,179
285 4,228,180
300 4,228,181
4,228,182
301 4,228,183
309 4,228,184
324 4,228,185
327 4,228,186
330 4,228,187

CLASS 425

208 4,227,870
533 4,227,871

CLASS 426

11 4,228,188
40 4,228,189
45 4,228,191
231 4,228,192
233 4,228,193
321 4,228,195
407 4,228,196
419 4,228,197
421 4,228,190
548 4,228,198
578 4,228,199

CLASS 427

47 4,228,200
92 4,228,201
212 4,228,202
229 4,228,203
372.2 4,228,204

CLASS 428

35 4,228,205
4,228,206
80 4,228,207
95 4,228,208
108 4,228,209
131 4,228,210
203 4,228,211
209 4,228,212
4,228,213
212 4,228,214
216 4,228,215
288 4,228,194
307 4,228,216
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	63	257,300
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	96	257,302
	123	257,303
	162	257,304
	184	257,305
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	192	257,308
	201	257,309
D7—	1	257,310
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		257,312
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	70	257,314
	79	257,315
	137	257,316
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	29	257,319
	343	257,320
	354	257,322
	356	257,321
	383	257,323
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	193	257,341
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D14—	11	257,345
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	20	257,347
	40	257,349
	53	257,350
	68	257,351
	73	257,352
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D16—	33	257,355
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D19—	21	257,361
D21—	74	257,375
	80	257,374
	86	257,363
	93	257,364
	108	257,365
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	4,227,347		4,227,690		4,228,410		4,227,517		4,227,387		4,228,461
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9 :	4,227,671		4,227,826		4,227,431		4,228,360		4,227,618		4,227,363
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